AMERICAN
JOURNAL OF SURGERY

VOL. XXIV. FEBRUARY, 1910. No. 2.

CONCERNING GENERAL RACHIANESTHESIA.*

PROFESSOR THOMAS JONNESCO,
BUCHAREST.

The editorial in THE AMERICAN JOURNAL OF SURGERY, January, 1910, entitled "Jonnesco's Contribution to Spinal Anesthesia," brings up some points to which I should like to call attention.

1. It is an error to confuse lumbar rachianesthesia, conceived by Corning and popularized by Bier, with my method. As I have many times emphasized, my method is a new one and altogether distinctive, because I have generalized spinal anesthesia, adapting it to *all* operations on *any* part of the body. This has not yet been done by others, although it is now a year and half since I read a paper on this subject at the International Surgical Congress in Brussels. I secured this anesthesia by piercing the spinal column at all levels, and by adding strychnine to the anesthetic—stovaine, novocain, tropococaine, etc.

I trust that true scientists will cease to urge Corning as the inventor of my method. Nobody denies Corning's accomplishment, but the difference between his method and mine is so great that it allows no comparison.

2. In the above-mentioned editorial there are described only four cases injected by me, at Mount Sinai Hospital, N. Y., and nothing is said concerning the twenty-three cases on which I demonstrated in various cities of the United States.

It is stated that the patient operated upon for a tumor of the breast experienced pain, and that, therefore, the anesthesia was not complete. Every surgeon knows that it is impossible to operate on a conscious, unanesthetized subject without his making some movements of protest, some efforts at defense. But this boy, who was quite conscious, who knew his chest was being cut, did not make the least movement of resistance, either with his upper limbs, which were paralyzed—proving complete anesthesia—or with his lower limbs, which were neither paralyzed nor anesthetic. Why did not that boy defend himself against the pain caused by the operation? Because he did not feel; he had no pain. He knew he was being operated upon, he felt the traction exercised on the tumor, but he had no pain. If he did complain a little, this is to be attributed to the mental impression made upon him by the knowledge that he was the object of an experiment being conducted before a large audience. If not such a psychological state, what, then, can better explain this patient's manifestations, while his body was motionless on the table.

3. The instance in which I performed two superior spinal tappings without result, is a very rare occurrence. In my own clinic and under other circumstances I would have tried again, and have succeeded, as I succeeded in all my other demonstrations in Ameria, and in the 187 cases operated upon by me or my assistants. That I did not persist in this case was merely because I did not deem it right to further prolong a demonstration that was conclusive from the three other cases.

As to the facility with which I make the injection, Coley, Gibney, Morris, Rodman, Laplace, Frazier, Murphy and the Mayos can give better details than I can myself. In my clinic all the injections, even the superior ones, are performed every day in the week, not only by my graduate assistants, but also by the internes and externes, who are mere students. This illustrates how easy and simple the method is.

As to the value of my method, I am strongly convinced that even the most stubborn surgeons will, in time, become its adherents. At present, my statistics cover 758 cases operated upon from July 5, 1908, to November 8, 1909, either by me or by my assistants. Two cases in London and 23 in America bring the total to 783, of which 195 were superior dorsal and 588 dorso-lumbar injections—without any death or grave accident. If I add the 603 earlier lumbar anesthesias, I have a record of 1,386 rachianesthesias without mortality.

If that number is not large enough to convince some of my colleagues of the complete harmlessness of my method, I hope soon to be able to report to them two or three thousand cases; for in my clinic all operations have been performed by this method

* Translated from Roumanian by Lazear Sasover, M.D., New York.

for the past two years—with the best result, as I have proved and will continue to prove.

The fact that American surgeons, even the most stubborn, do accept my method as suitable for cases where ether and chloroform are contraindicated, proves that it is a success. Because to admit that they can operate safely under rachianesthesia on patients who would be doomed if given ether or chloroform, and to say that they cannot safely operate by my method upon patients who cannot stand ether or chloroform, is not scientific at all. It shows a fear on the surgeon's side for all that is new, rather than a conviction that the method is bad.

Unquestionably those who want to use my method successfully and regularly, must learn its technic and acquire both skill in the manipulation and the ability to employ proper doses, according to the patient's age and constitution. (See *British Medical Journal,* November 13, 1909.) Only faith in the method and steady practice will make the surgeon safe, and inspire confidence in his patient. I am sure that many American surgeons,—whose skill I admire—will be anxious, as every artist ought to be, to advance rather than to stand still; and they will soon practice my method of rachianesthesia with due skill, to the welfare of the patient and the credit of surgery.

5. The fact that, with my method, the respiratory nerves are not involved, although all the other nerves [of that spinal region] are paralyzed, is due, I think, to the influence of the strychnine. The injection of stovaine alone in the superior dorsal region stops respiration, even with small doses. It is probable that from the injected mixture the strychnine is set free, and this, having a selective power, acts first upon the respiratory and cardiac nerves, as well as upon their centers. These, having been stimulated by strychnine, are no longer influenced by the stovaine or other anesthetic. This explanation is not given as a definite one, but it is the most probable. Whatever the reason, the fact is that if strychnine is added to the anesthetic solution respiration and heart action will continue.

PUS TUBES IN THE MALE

Pus infection of the seminal tract plus occlusion of the ejaculatory duct soon converts vesicle, vas and finally epididymis into a closed abscess. Vasostomy is the simplest and least objectionable means of evacuating pus, relieving tension and medicating vas and vesicle.—Wm. T. BELFIELD in *Journal of the American Medical Association.*

SUBDURAL HEMORRHAGE OF TRAUMATIC ORIGIN, WITH REPORT OF A CASE.

THEODORE A. McGRAW, JR., M.D.,
DETROIT, MICH.

Using the word subdural in the broad surgical sense, we may define subdural hemorrhage as hemorrhage into that space which lies between the dura mater and the cortex, and which contains the arachnoid, the pia mater, and the cerebro-spinal fluid.

ETIOLOGY.

The source of the hemorrhage is, in the great majority of cases, the small vessels of the pia. In a small number of cases the hemorrhage comes from the internal carotid, its continuations, the cerebral or other basilar arteries or from a venous sinus. Occasionally the hemorrhage, following rupture of the middle meningeal artery, becomes subdural through rupture of the dura mater at the time. The rupture of the small vessels of the pia may be caused by traumatism incidental to depressed fracture of the skull over the site of rupture, by traumatism to the skull over the site of rupture, but without fracture, by traumatism to the skull, with or without fracture, at the point distant to the site of rupture, the force being transmitted through the cerebro-spinal fluid. Stimson[1] quotes Duret as follows in regard to this form: "The hemorrhages from the vessels of the pia mater are attributed to the rupture of the smaller vessels by the sudden forced shifting of the cerebro-spinal fluid under the influence of the blow, and the change in the shape of the skull thereby produced, by which certain portions of the space in which it is contained are sharply distended and the connected vessels torn. This is the explanation of the presence of hemorrhages found at points distant from the one struck."

Traumatic hemorrhages from the internal carotid or from one of the basilar arteries are generally fatal; the blood coming in nearly a straight line from the carotid under high pressure causes death very quickly with marked symptoms of compression. The sinuses are frequently injured but the injury is usually combined with external trauma, the blood flowing in large volume from the wound. It is only exceptionally that rupture of a sinus gives rise to subdural clot. In Wharton's[2] collection of seventy cases of wounds of the venous sinuses, only four were positively subdural as to clot.

PATHOLOGY.

In order to obtain a clear conception of the path-

ology of subdural hemorrhage it is necessary to touch briefly upon the anatomical peculiarities of the membranes covering the brain. As has been said, the vessels of the pia are the chief sources of this variety of intracranial hemorrhage. This is described as a "vascular membrane consisting of a minute plexus of bloodvessels held together by an extremely fine areolar tissue."[3] In this delicate membrane the veins predominate and are the longer; this is especially true of the upper and lateral aspects of the cerebrum, for here they form a complicated plexus emptying into the longitudinal sinus. The pia mater adheres very closely to the cortex and accurately follows its convolutions; the arachnoid, on the other hand does not conform to the convolutions, but, like the dura mater, envelopes the brain as a whole.

There remains, therefore, considerable space between the two membranes, especially where the convolutions dip downward; this, the subarachnoid space, contains fine spongy tissue, in the meshes of which lies the cerebro-spinal fluid.

So, according to the location of the clot, we distinguish three varieties of subdural hemorrhage. Beneath the pia, in the pia or above the pia, called subpial, pial and suprapial (or subarachnoid). Hemorrhage confined to the meshes of the pia itself must, of course, be very small in amount and is usually unrecognizable. The subpial variety, having to dissect a cavity for itself, is apt to be much less extensive than the suprapial form (which fills at once a ready-made cavity), and is almost invariably associated with severe contusion and laceration of the brain substance, and, overshadowed by the greater lesion, is only of importance as a part of the latter. Suprapial hemorrhage, however, may exist with or without other injury at the site of hemorrhage and gives rise to definite pathological conditions depending upon the character of the resulting clot; with a hemorrhage of any size we expect to find a large portion of the pia covered with a flat clot, the so-called "brain-cap." This fills and distends the subarachnoid space, being especially thick at the base. Murray[4] calls attention to the fact that though, when the blood is poured into the subarachnoid space, the anatomical conditions favor the formation of a diffuse clot, "frequently at operation the blood is found to be circumscribed, resembling the form characteristic of extradural hemorrhage." Wiesmann[5] explains this occurrence by saying that "probably in these cases a flat-shaped extravasation took place in the beginning, which coagulated at the periphery, preventing diffuse spreading when hemorrhage took place later."

After the hemorrhage, what becomes of the effused blood? Providing, of course, there is no operative interference, one of several events may occur. Very exceptionally the blood may remain in the fluid state for a long time; as a rule coagulation soon takes place. A small clot may be quickly and more or less completely absorbed, the only evidence remaining being a slight thickening of the membranes, or possibly merely a hematin stain on the under surface of the dura. Archibald[6] thinks that "the conditions for reabsorption in the intradural space are largely more favorable than in the extradural, owing, probably, to the diluent action of the cerebro-spinal fluid, and its free exit into the veins." In the majority of cases organization of the clot takes place; it shrinks, squeezing out the serum, and becomes surrounded and infiltrated with connective tissue; a firm plate results resting on the brain and adherent to the dura. In certain cases organization is much delayed; Starr[7] mentions a case in which three months after injury the clot was only partially organized.

Finally, in place of either absorption or organization, a not infrequent occurrence is the formation of the arachnoid cyst. Coagulation taking place very slowly, the fibrin is deposited in a thin layer on the sides of the cavity containing the clot; this forms a framework for the development of the connective tissue which is to form the wall of the cyst. The pigment is gradually absorbed and the final stage of the process completes a fibrous-walled cyst filled with clear serum. This cyst may persist indefinitely. There are rather wide differences of opinion concerning the length of time necessary for the formation of such a cyst. Putzel[8] asserts that the cavity may contain serum by the twentieth day and the cyst wall be completed in from four to six weeks. Other authors, notably Starr,[7] give a much longer time to the process, from three months to two years.

What is the effect of the extravasation upon the brain itself? Discussion of the vast subject of brain-compression with its many ramifications is not within the scope of this article. For our best knowledge of the subject we are indebted to Kocher, and his monograph,[9] setting forth the results of his researches, has become a classic of medical literature. For a concise summing up of the whole subject the reader is referred to Archibald's excellent article in the *American Practice of Surgery*.[10] Certain facts, however, relative to the

mechanics of compression demand brief mention. The brain being essentially incompressible, how, then, is room made in the cranial cavity for the effused blood? First, the brain itself moves toward the spinal canal, pressing the medulla and cerebellum down until they block the foramen magnum. The pressure increasing, more space is gained by pressing out the cerebro-spinal fluid from the cranial cavity, and the blood from the vessels of the brain and its membranes; the veins being first affected, then the capillaries and arterioles. An anemia of the brain results, local or general according to the character of the hemorrhage and its resulting clot. A general anemia or one involving the bulb is, if persistent, soon fatal, while a local anemia of the cortex may be long endured. The next step, supposing the pressure still increasing, is the indenting of the brain substance at the expense of its cavities.

At any stage of the compression, provided, as noted below, it has not been too long continued, the pressure being removed, the tendency of the brain is to expand and resume its original form; removal of the pressure unless brought about by operative interference, depends upon the shrinkage and absorption of the clot. Should the pressure be too long endured, as may happen with localized clot over a "silent area," permanent changes in the brain tissue (edema, degeneration, organization and finally atrophy) and in the compressed vessels (obliteration of their lumina) occur; then, even though the pressure be removed, the depression of the brain would be permanent. How long such pressure can be exerted without the permanent changes obtaining, it is difficult to estimate; in a case reported by Taylor[11] of extensive compression by a subarachnoid cyst, operated upon seven months after injury, the brain expanded visibly when the cyst was lifted; in other cases of less duration, the contrary has been noted.

SYMPTOMS.

Subdural hemorrhage is very frequently complicated by other severe lesions, the symptoms of which often confuse or may entirely mask those of the hemorrhage. These complications may be severe and prolonged concussion, fracture of the skull, or contusion or laceration of the brain. It is the writer's intention to consider in the present article only the uncomplicated cases. In general we may say that the symptoms of subdural hemorrhage are those common to cases of increased and progressive intracranial tension from any cause, the symptoms due to brain compression. There are, however, certain characteristic symptoms peculiar to the different forms of subdural hemorrhage and these can perhaps be best brought out by describing the clinical pictures presented by such cases.

First, the quickly fatal cases; here the rupture of one of the larger arteries, such as a basilar vessel, results at once in overwhelming compression of the vital centers at the base; there is no return of consciousness after the injury and the symptoms of a rapidly progressive general compression terminate in death. Second, cases of moderate severity, with a long or short free interval and exhibiting symptoms of a general and not a localized compression. The patient gives a history of having received a blow upon the head which may have been followed by a period of unconsciousness, due to concussion, lasting a few minutes or a few hours; but in many instances when the traumatism has been (apparently) very slight, there may be no interval of unconsciousness. Following this is the so-called free interval. The symptoms of concussion, if they were present at all, have disappeared and, although the brain is undergoing compression, the latter is not yet marked enough to cause symptoms. This interval corresponds to the "stage of compensation" of Kocher, to whose monograph, already mentioned. the reader is referred for a detailed explanation of the physiological mechanism of compression. Briefly it is a struggle between the compressing force and the vasomotor center; the free interval lasts so long as the pressure in the vessels is greater than that exerted by the extravasation; as soon as the blood pressure begins to be outstripped by the compressing force, the symptoms of compression begin and the free interval ends.

The duration of the free interval varies greatly within wide limits, but a very long one, compared to that common in extradural hemorrhage, is characteristic of the subdural variety. In the former the free interval is a matter of a very few hours at the most; it rarely lasts as long as three days. In the latter it is usually more than three days and may last two months or more. What is the explanation? The duration of a short free interval in either form of hemorrhage depends directly upon the rapidity of the bleeding; it is simply a question of the time necessary for enough blood to be extravasated to cause symptoms of compression and so end the free interval. Archibald[12] explains the long free interval usual in subdural hemorrhage in contrast to the short one of the extradural variety as

a difference in the blood-pressure between vein and artery; this explanation is probably the true one as applied to a free interval of a few days; it might well take that long for even persistent hemorrhage from small pial veins to produce compression symptoms. That this explanation could be applied to those cases in which there is a free interval of a month or more does not seem possible. In such cases we must accept the theory of a secondary hemorrhage. In the case reported with this paper such an event undoubtedly occurred.

Hume[13] in reporting a similar case accepts the theory which Hewett[14] brought out a number of years ago and it seems worthy of acceptance until at least a better one is forthcoming. In speaking of the changes which the effused blood undergoes, he says, "He (Hewett) shows that these changes are not the result of inflammation; that they begin with the coagulation of the blood and with the natural tendency to the formation of an adventitious membrane encapsulating the clot. Such an encapsulated clot adheres readily to the surface on which it rests in contact—in this instance the arachnoid surface of the dura mater. Adhesion is speedily followed by organization through the agency of the newly formed bloodvessels which penetrate the adventitious capsule and serve to bind it more intimately to the surface to which it adheres. But these new vessels are fragile and easily ruptured and this fact gives the key to such cases as that under consideration. A hemorrhage in the first instance may be so slight that the subject of it suffers only a passing disablement. When the resulting clot is becoming organized an incidental rupture of the newly-formed vessels takes place and a fresh hemorrhage occurs; and this sequence once started may repeat itself indefinitely. It follows that a hemorrhage originally small in amount may in the end lead to fatal compression."

Returning to the case under consideration (one of general compression) the first symptoms will be those of cortical irritation, reflex symptoms due to the pressure on the nerve-ending of the fifth nerve in the dura. These are headache, restlessness, mental excitement, insomnia and delirium. Should the pressure at this time affect the bulb as well, slowing of the pulse and some rise of blood pressure will occur. As the cortical compression increases, the stage of excitement gives way to one of somnolence which soon developes into a condition of stupor from which the patient can only with more and more difficulty be aroused; the final stage is coma. As the bulbar compression increases the pulse becomes still slower and its tension higher; respiration first quicker and deeper, then slow, sterterous and arhythmical, the Cheyne-Stokes type finally developing. The pupils are dilated and fixed; the fundus shows choked disc; there is incontinence of bladder and rectum. Then as the vagus and vaso-motor centers fail, the pulse becomes rapid and the blood pressure falls; death finally intervenes by failure of the respiratory center.

The progress of this series of events will, of course, come to a halt at any time, should the pressure cease to increase. The cases, indeed, where the pressure is not exerted beyond the stage of irritation are in some respects the most interesting, because, in the absence of both focal symptoms or the major symptoms of general compression, the diagnosis is often so obscure that operative interference is not thought warranted. In fact, a comparatively large amount of intracranial space may be taken up by the compressing fluid before any marked symptoms are in evidence. Cushing[15] says, "that the cerebral chamber may harbor a foreign body of 1/10 to 1/8 the size of the brain without necessarily giving an indication of its presence and far from producing any of the so-called characteristic or major symptoms." So there is a third class of cases (to be discussed more in detail under the head of diagnosis), in which some time after a head injury there developes the so-called "late effects." At autopsy or at operation a clot at the base, either not large enough or not in the right position to give bulbar symptoms is found, or a clot or cyst over a "silent area." In speaking of the latter Ballance[16] thinks that "the presence of such an arachnoid hematoma explains many of the cases in which a blow on the head or a fall is followed at some distance of time by obscure cerebral symptoms, among which mental disturbance and transitory paralysis are prominent."

A fourth class of cases is of those exhibiting focal symptoms. When in subdural hemorrhage the effusion remains localized over a motor or sensory area of the cortex, the focal symptoms resulting depend upon the size of the clot and the position and extent of the area upon which pressure is exerted. It is not possible in an article of this length to dwell long upon the focal symptoms; there may be merely a slight spasm of a limb where the clot is so small that it only irritates the cortex, or a complete paralysis where the pressure is great; between the two extremes there are many gradations which at times may be all seen during the

progress of a single case as the character of the effusion changes, either by absorption, cyst formation or secondary hemorrhage. In the latter event the symptoms of general compression may be added to or overshadow the symptoms of the local compression as the effusion becomes diffuse.

DIAGNOSIS.

The question of diagnosis is of least importance in cases in which the localized clot gives symptoms referable to definite cortical areas, because here operation is indicated to relieve pressure, no matter from what cause it arises. The same may be said of most cases of diffuse clot presenting the major symptoms of general compression. The really important cases from a diagnostic standpoint are those obscure ones presenting no definite focal or general symptoms, for here the matter of treatment must stand altogether upon the diagnosis. However, it should be mentioned in passing that, with cases giving definite focal symptoms, the diagnosis is very often that of extradural hemorrhage until, at operation or autopsy, the collection is found beneath and not above the dura.

A differential diagnosis is often impossible, but the following points are of value as indicating subdural hemorrhage; they are given in order of value, but none is absolutely reliable. 1. The presence of blood in the cerebro-spinal fluid. 2. A long free interval, especially one over twenty-four hours. 3. The compression affecting the leg center before the arm center. 4. A slow increase of symptoms after the free interval ends.

Mention must also be made of the three chief clinical aids in the determination of the presence of intracranial hemorrhage; the lumbar puncture needle, the blood-pressure apparatus and the ophthalmoscope. The latter is of especial importance not only in showing the presence of choked disc, but because in a very early stage of general compression it may detect changes in the fundus indicative of that condition. Von Schulten,[17] as a result of his experiments upon animals, was the first to describe these changes, and his findings are in part as follows: "———One sees changes in the papilla and its vessels; the depth of the papilla becomes less as its ground is pushed forward, its diameter and also the distance between the points of entrance and exit of its vessels is slighter. The two retinal arteries and their branches appear considerably finer; the retinal veins on the other hand become swollen, darker, distended with blood and their tortuousness more and more marked; veins which before could be hardly seen, now become distinct." This sign owes its chief importance to the fact that at the time it exists, it is often the only sign of compression available. Cushing,[18] among others, recognizes in this phenomenon a diagnostic aid of great value.

Let us now turn to the consideration of the more obscure cases, those in which the effusion affects neither the bulb nor the areas concerned in motion or sensation, but the so-called "silent areas." These cases demand the most thorough, painstaking and oft-repeated examinations. The most important clue, perhaps, is the history of previous traumatism; at times it will be elicited only after exhaustive questioning because in these cases the injury has often been so slight as to have entirely escaped notice and, too, the symptoms which cause the patient to seek medical advice may occur so long after the accident that to the patient or his friends there is no connection between the two. The symptoms when they first appear are so vague that they are not of great value—headache, dizziness, irritability of temper, lack of self-control, melancholia or convulsions—for they are manifestations common to other cerebral conditions, yet when appearing after a head injury and steadily progressive in intensity, the picture becomes very suggestive of clot or cyst, though not yet definite enough to warrant operation. Usually, however, there soon comes a time when the close observer may detect certain signs, at first very vague, indicating roughly the area of brain involved; perhaps the headache is more persistent on one side of the head; the pupils not quite equal in reaction or site, a slight spasticity of a limb, muscular twitchings or convulsive movements more marked on one side or in one limb, etc., may give a hint as to the location of the lesion. The relation of these signs to the side which received the injury is not of much importance because the force in these cases is so often transmitted by contrecoup.

No general rule can be formulated as to when, in the progress of such a case, operation is indicated; that must be left to the experience and judgment of the surgeon to decide in each individual case; but as the technic of intracranial surgery continues to improve, we shall come more and more to early operation in this class of cases, even though the exact diagnosis must be left more or less uncertain. Cases of this type, it is true, form only a small percentage of the total, yet are by no means a rarity. Medical literature contains many. The great majority are either not diagnosed at all, or not until the extension of the lesion gives un-

mistakable signs of local or general compression, when so many times impending death precludes operations; a few improve with the absorption of the clot, still fewer entirely recover, the remainder continue to suffer progressive mental disturbances until insanity developes or death occurs. Are not these indeed the cases in which prompt, well-directed surgical interference can often accomplish such brilliant results—results which in themselves are a plea for earlier diagnosis and operation?

TREATMENT.

During the past decade early operation has come more and more into favor in subdural hemorrhage, while the expectant treatment has fallen proportionately into disrepute. The factors largely responsible for bringing about successful results in the operative treatment of this class of cases are the advancement in methods of diagnosis and the vast improvement in operative technics. Murray[19] voices well the modern idea, at the conclusion of an article advocating early operation in intracranial hemorrhage, thus: "The result of hemorrhage, whether it be extradural or subdural, is always the compression of the brain by clot, and the sole indication of treatment is removal of the clot, and checking the hemorrhage. The important point for the surgeon is to recognize the presence of intracranial hemorrhage and if the symptoms of compression are severe, to immediately relieve the compression, no matter what may be the source of the hemorrhage."

Whereas formerly only a few selected cases of subdural hemorrhage were deemed operable, we now extend operative aid to a variety of such cases. The least favorable from an operative standpoint are those in which the rupture of one of the larger arteries results in very rapidly progressive general compression which speedily involves the vital centers; here the very nature of the injury bespeaks severe accompanying lesions, especially concussion and fracture of the base. The prognosis is undoubtedly bad whether we operate or not but, with quickly increasing bulbar compression, operation takes no chance from the patient and in a small percentage of cases makes for recovery. It is true that as yet comparatively few of these cases have come to operation, but if only one in one hundred survive, we are justified in giving to the patient his one chance for life. At the same time the surgeon should not fail to make it clear to the patient's friends what a small chance operation offers. Cushing[20] puts it thus: "In cases of generalized compression from widespread hemorrhage, when there are no localizing indications, the intracranial tension should be relieved by elevation of a large osteoplastic flap from one hemisphere or the other, with a corresponding opening in the dura."

As for the other types of subdural hemorrhage, before mentioned, there is not one that does not demand early decompressive measures.

Complete recovery without operation in cases of subdural bleeding severe enough to give symptoms, is a rare event; the cases which do recover are the ones of slight pial bleeding which give no symptoms and only show, in the post-mortem room, by slight discoloration of the dura, with possibly very fine adhesions. Cases diagnosed as subdural hemorrhage that recover completely and without operation, are probably in most instances really conditions of cerebral edema.

"Trephine and trephine early," said Jacobson[21] nearly a quarter of a century ago, in reference to extradural hemorrhage, and this oft-quoted advice, applicable as well to the subdural variety has never been improved upon.

CASE REPORT.

J. G., water inspector; 50 years of age; in good health until accident; moderately alcoholic.

On the evening of August 31st, while getting out of a launch, he fell and struck his forehead on the gunwhale, inflicting an incised wound just over the left eyebrow. He remained unconscious for three-quarters of an hour, and, on recovering, complained of severe frontal headache and dizziness. There was no bleeding from the ears or mouth. The following day he complained of numbness and loss of power in the left leg; he dragged it a little and often stubbed his toe. During the next few weeks severe attacks of headache, localized on the right side, were experienced; these increased in frequency and severity and the patient, who had previously been of good disposition, now became ugly and morose and was easily incited to anger and even violence.

Although suffering from the above symptoms, which were gradually increasing in severity, he continued with his work until seven weeks after the accident. Then, while lying on a sofa, he experienced a sensation which he described as a shadow passing over the left side of his body. He at once noticed a diminution of power in his left hand and arm; at first, though he could seize an object in his hand, he had difficulty in loosening his grasp; afterwards this spastic condition passed into one of complete paralysis of the arm and hand. On October 31st, just two months after the injury, he became irrational and at times delirious; four days later a condition of stupor, alternating with the delirium, was noted. During all this time and up to two days before his admission to the hospital, the patient had no medical advice of any kind.

On admission to St. Mary's Hospital, the fol-

lowing notes were made: Patient of large frame and well nourished. He is in a condition of stupor approaching coma, from which he can be roused only with the greatest difficulty, and into which he relapses at once. Respiration, slow and stertorous, but rhythmical. Pulse 60 and of high tension. Temperature (axillary) 99°. Involuntary micturition and defecation. Urine normal. There is a scar one and one-half inches long running upward and outward from the junction of the middle two-thirds with the outer third of the left eyebrow. No unevenness of the bone beneath. The pupils are equally contracted and respond to light. The face is symmetrical. The right limbs are apparently of normal power; there is complete paralysis of the left arm, forearm and hand. There is partial paralysis of the left thigh and leg. The knee-jerk is exaggerated on the paralyzed side.

Operation, November 7th, by Dr. McGraw, Sr.: A semi-elliptical incision, three inches long, was made over the region of the right fissure of Rolando. The bone was laid bare of the periosteum and an oblong section one and one-half inches by three-quarters of an inch was chiseled out. The dura showed no pulsation, but did not bulge into the wound. A slit was made in the dura parallel to the incision and there was a gush of dark fluid, apparently a mixture of serum and disintegrated blood-clot. After the first flow subsided a considerable amount was further expelled with each pulsation of the brain. The cavity was explored with a probe and found to extend downward and outward for about two inches. During the operation, though the pressure was removed from the brain, it did not expand and the depression caused by the effusion remained. A drain of rubber dam was placed within the dura, the scalp sutured and a fine drain placed in the opposite angle of the wound.

Shortly after the operation the patient was able to move slightly the left arm and hand. The following day, although the patient was recovering rapidly the use of the arm, a spastic condition of the left elbow manifested itself; on attempting extension spastic resistance obtained which could not be overcome without severe pain. The left leg, which had been partially affected, also regained its power. There was afterwards no recurrence of the paralysis.

Mental Condition. During the first day after the operation there was no change. On the second day he became quieter and more rational. Improvement continued and on the fourth day he recognized his friends and talked quite rationally. His only complaint was soreness of the left elbow. Forty-eight hours after operation, under rigid aseptic precautions, the first dressing was made. The gauze was found to be copiously saturated with blood and serum. At the end of the second forty-eight hours, less discharge was noted. After each dressing there was a temporary slight rise of temperature. His condition remained good until the seventh day, when he became very restless, the delirium returned and restraint had to be resorted to. The next day, stupor with low muttering delirium. The wound was reopened and a small quantity of bloody serum withdrawn. This procedure, however, was ineffective and the patient went into coma. Up to the thirteenth day after operation the temperature averaged 100° and the pulse 85. The leucocyte count on the seventh day was normal, on the eleventh slightly above. On the thirteenth day the patient showed evidence of beginning sepsis with a preliminary rise of temperature to 102° and of pulse to 104. Both fell rapidly during the next two days and approached normal. At this time there was no discharge from the wound. Kernig's sign was present, but no other positive symptoms of meningitis. The condition of coma continued and on the seventeenth day death ensued.

Autopsy. The examination was confined to the head. On the right side on the under side of the dura, around the site of the incision, there was an inflammatory exudate the size of the palm of the hand. On removal of the dura, which was nowhere adherent, it was seen that the surface of the entire frontal lobe was indented and cup-shaped and for an area of 2 by 3 inches covered with a very thin organized clot. A slight indentation existed at the site of the opening, but not as deep as that in front. Careful examination revealed no fracture of the skull.

Interesting features of this case are:

1. Rupture of the pial vessels by contrecoup.

2. An extravasation affecting the "silent area" and giving symptoms of mental disturbance and localized headache, but also

3. Slightly affecting the motor center for the leg (hence no free interval).

4. Seven weeks after the injury a sudden secondary hemorrhage affecting first the arm center (spasm followed by paralysis), then the base, with involvement of the bulb.

5. The clearing up of the mental disturbance and the motor symptoms (except slight spastic condition) on decompressive measures.

6. No expansion of the brain on removing pressure.

Had this patient been seen soon after the accident, he would have presented an ideal case for early operation. The mental disturbances and persistent headache immediately following trauma, together with slight motor symptoms as a localizing aid, would have been sufficient for a diagnosis and warranted operative interference. Unfortunately, the patient received no medical aid until two months after the injury; then, though the decompressive measures were successful, a poor vitality and lowered resistance succumbed to the accident of sepsis.

REFERENCES.

1. STIMSON: Fractures and Dislocations.
2. WHARTON: *Annals of Surgery,* July, 1901.

3. Gray's Anatomy, Edition 1905.
4. MURRAY: *Annals of Surgery*, vol. xliv.
5. WIESMANN: von Bergmann's System of Surgery.
6. ARCHIBALD: *American Practice of Surgery*, vol. v, p. 181.
7. STARR: Organic Nervous Diseases.
8. PUTZEL: Reference Handbook of Medical Sciences, vol. I.
9. KOCHER: Nothnagel's spezielle Pathologie und Therapie, Bd. ix, Th. iii.
10. ARCHIBALD: *Ibid.*, p. 111 *et seq.*
11. TAYLOR: *Lancet*, August, 1903.
12. ARCHIBALD: *Ibid.*, p. 189.
13. HUME: *Lancet*, Sept., 1908.
14. HEWETT: Holmes' System of Surgery.
15. CUSHING: Mütter lecture, *American Journal of Medical Sciences*, Sept., 1902.
16. BALLANCE: *Lancet*, Dec., 1907.
17. VON SCHULTEN: *Archive für Chirurgie*, vol. xxxii.
18. CUSHING: *American Journal of Medical Sciences*, 1903, p. 1020.
19. MURRAY: *Ibid.*, p. 392.
20. CUSHING: *Ibid.*
21. JACOBSON: *Guy's Hospital Reports*, vol. xliii.

73 CASS STREET.

THE TONSILS.

Of the structure of the tonsils we know much, but their exact purpose in the animal economy has not yet been made satisfactorily clear. They are found as low in the animal scale as the fishes and are possessed by some quadrupeds, though lacking in a few. In none do they play any conspicuous rôle, and their function is doubtless mostly a thing of the past. Their very free lymphatic connections are with the deeper chain. Whether they can be properly considered as having a distinct secretion of their own is doubtful, yet in certain forms of sickness they certainly loom up most conspicuously, sometimes at one end of the chain and sometimes at the other. The general disturbance which may be caused by trouble apparently beginning in the tonsils is scarcely greater than that which, in some instances, appears as a latter manifestation of certain septic infections. They possess clinical interest for the surgeon not alone because they are enlarged in many cases, if not in most of the status lymphaticus. In this status they accompany enlargement of the other adenoid tissues which constitute the embryonic adenoid ring that surrounds the upper end of the neurenteric canal as Luschka's gland surrounds or marks the lower. Here they offer numerous obstacles to easy and safe anesthesia. They seem able also to produce an amount of toxic material that completely upsets the harmonious operation of many other parts of the body. This toxemia may be acute or chronic, and has far reaching complications in involvement of the lymphatics, and the secondary changes which occur in them, often preparing the way for tuberculosis as a secondary infection.—ROSWELL PARK, in *Northwest Medicine.*

PERFORATION IN TYPHOID FEVER.*

H. BEECKMAN DELATOUR, M.D.,
Attending Surgeon, St. John's and Norwegian Hospitals; Consulting Surgeon, St. Mary's Hospital, Jamaica; Surgeon-in-Chief, Methodist Episcopal and Jewish Hospitals,
BROOKLYN, N. Y.

The question of whether to operate in cases of typhoid perforation is still an unsettled one. With those who believe in operation, the time of election is being debated. There is no doubt in our minds that many cases considered as perforation are really deep ulceration in which a local peritonitis has developed. We have seen such ulcers during operation, in which only the thin layer of peritoneum remained. There are other cases in which perforation has actually taken place, but before it was complete a local peritonitis had shut in the affected area. These cases recover without operative interference.

M. Chautesmesse gives 35 instances of perforation in 2,000 (1.7 per cent.) cases of typhoid, while other statistics run as high as 199 perforations in 7,363 cases, or 2.7 per cent. The probable cause of the perforation is thrombosis of the vessels of the follicles.

The occurrence of perforation is usually marked by a sudden onset of pain localized in the lower abdomen, retraction of the abdominal wall and tenderness to pressure. There is usually a marked immediate drop in temperature which does not persist. Murphy says "a rather early sign due to the sudden shock to the nervous system is the spinal epilepsy caused on the same side as the lesion by suddenly straightening the foot on the leg." This we have never observed. Murphy gives the following syndrome of perforation in the order named:

1. Pain;
2. Nausea or emesis;
3. Local tenderness;
4. Rigidity of the abdominal wall;
5. Elevation of temperature above the average for that hour or day;
6. Presence of peristalsis over the zone of pain;
7. Leucocytosis;
8. Flatness on piano percussion.

Our experience has been, as above stated, that the immediate perforation is accompanied by all the signs of severe shock, with lowered temperature which rapidly tends to rise.

When should operation take place? Our answer

*Read before the Brooklyn Pathological Society, November 11, 1909.

would be just as soon as possible after the diagnosis is made. This can hardly be arranged immediately and during the hour or so intervening the patient will have sufficiently recovered from the shock. Two methods have been recommended which are said to produce an increase of the leucocytosis and peritoneal phagocytosis. These are the subcutaneous injections of nucleinate of soda and intermittent over-heating of the abdomen. With these we have had no experience and would hardly feel justified in taking the time to administer them.

We have operated upon seven cases of typhoid perforation, with three absolute recoveries, one doubtful, and three deaths.

The method of procedure has been as follows: Either ether or chloroform anesthesia; median abdominal incision long enough to easily admit the hand; the immediate identification of the cecum and then the withdrawal from the abdomen of the small intestine for about eighteen inches from the ileo-cecal valve. In this area we are quite sure to find all the perforations and we should carefully search for them *all,* for in many cases there is either more than one point of actual or impending perforation. Some cases have been reported in which recovery had taken place from the operation only to be followed by another perforation. We should try to guard against the danger of this by careful inspection of the area of probable disease and reinforce any points of threatened perforation.

CASE I.—Seen with Dr. Waterman about sixteen hours after perforation. Male, aged 23, fine physique. Abdomen greatly distended; painful to pressure and marked rigidity of both recti. Operation revealed a large perforation and a smaller one near it in the ileum about twelve inches from the cecum. The opening was closed by a purse-string suture. The pelvis was full of feces. This was thoroughly washed away with saline solution, a drain was inserted to the pelvis; and the abdominal wound was closed. Patient rallied well and the next morning was quite bright, but much distended. He died the following day.

CASE II.—Patient of Dr. Walsh. A very fat man, aged 40. Seen three hours after perforation. Operation one hour later at the Methodist Episcopal Hospital. In this case the pelvis was filled with liquid feces and a large hole was found in the ileum with a second point where nothing but the peritoneum remained so near the first that the suture of the openings so constricted the bowel that resection was found necessary. Wound closed without drainage. Death forty hours later from exhaustion and pulmonary edema. There were no signs of general or local peritonitis.

CASE III.—Patient of Dr. J. Merzbach in the Jewish Hospital. Male, about 60. Perforation about six hours before operation. Three perforations were found in the ileum within fifteen inches of the cecum. All closed by silk sutures. Pelvis thoroughly irrigated with saline solution. Wound closed without drainage. Patient survived only a few hours.

CASE IV.—Young man, patient of Dr. Theodore Guenther at the Norwegian Hospital. Perforation in ileum about eight inches from the cecum. Operation within two hours of symptoms of perforation. Wound closed, after saline irrigation, without drainage. The patient recovered, but recovery was somewhat delayed by breaking down of the superficial wound.

CASE V.—Also a Norwegian, male, 19. Operation within four hours of perforation. Recovered, with slight wound infection.

CASE VI.—A Norwegian, about 23 years of age. Perforation in the ileum. Operation by Dr. E. D. Ferris. Patient recovered from the operation and during the next three days was in about the same condition as he had been previous to the operation. There was no evidence of peritonitis. On the fourth day after the operation he suddenly died. Whether this was due to an embolus or sudden heart failure we were unable to determine, for an autopsy could not be secured.

CASE VII.—A patient of Dr. E. E. Conwall in the Norwegian Hospital. Young man, aged 18. Perforation took place in the third week of the disease. Operation within three hours of first symptoms. On opening the abdomen there was an immediate escape of fluid feces. The perforation was found to be a very small one about ten inches from the cecum. It was about 1/16 inch in diameter, but the intestinal pressure was so great that on withdrawing the gut from the abdomen the fluid feces came from the opening in a stream fully eight inches long. This opening was closed by a purse-string suture of silk. Just beyond this point were two more areas which were about to perforate, the peritoneum alone remaining over an area of more than a quarter inch at each point. These places were closed by silk sutures. The pelvis was thoroughly irrigated, some saline solution being left in the pelvis, and the wound was completely closed. The patient made an uninterrupted recovery from both the operation and the typhoid. He is still in the hospital, but well in convalescence.

Of the seven cases we have three recoveries. Case VI apparently recovered from the effects of the perforation, although he died four days later.

These cases certainly should encourage the physician to urge immediate operation in cases of typhoid perforation. Our cases at the Norwegian Hospital were all operated upon early, a standing rule of the medical department being that the attending surgeon in such cases be notified at the

same time as the attending physician. This saves considerable time.

All our operated cases have been males. Besides these cases we have seen several others, some of whom were females, in which either the condition of the patient would not permit of interference or the family would not consent.

Immediately on opening the abdomen we introduce an irrigation tube to the bottom of the pelvis and start a saline irrigation which is kept going during the entire operation. This washes away the liquid feces and leaves the pelvis clean. Drainage does not seem to be necessary, as in none of our cases was there more than superficial infection. The operation can be completed in from fifteen to twenty minutes even when two or three points have to be sutured.

73 Eighth Avenue.

ANESTHESIA FOR INTRACRANIAL SURGERY.

F. H. McMechan, A.M., M.D.,

Anesthetist to St. Mary's Hospital,
CINCINNATI, OHIO.

Anesthesia as a phase of operative technics during intracranial surgery is a detail of such vital importance, that Prof. Frazier, of Philadelphia, writing recently in the *Journal of the American Medical Association*, said:

"In operations on the central nervous system, and more particularly in subtentorial lesions, with cardiac and respiratory centers often just on the verge of a breakdown, so that even comparatively slight insults are not tolerated, a greater responsibility rests on the *anesthetist* than in any other class of cases, except perhaps in such grave toxemias as peritonitis.

"So important is this feature of cranial operations that under no circumstances should an operation be undertaken unless the services of a skilled anesthetist are available.

"In addition to the anesthetist the operating staff should include an assistant, whose duty it is to record the blood pressure at frequent intervals throughout the operation. With these precautions, one may proceed with the operation with the fullest assurance that the patient's condition is being carefully watched and that the surgeon's attention will be immediately drawn to the first suggestion of an alarming symptom. . . . ."

The Position of the Patient During the Operation as the Paramount Factor in Selecting the Anesthetic and Conducting the Narcosis.

Continental surgeons, headed by Sir Victor Horsley, of London, who operate with the patient in the dorsal recumbent, the lateral or lateral prone positions, employ chloroform and oxygen for the conduct of all narcoses during their intracranial operations. Frazier, Cushing and those American surgeons who prefer the sitting posture, the prone or lateral recumbent position, maintained by special devices at various inclined angles, have of necessity turned to ether for their narcoses, since the administration of chloroform in any but the horizontal or

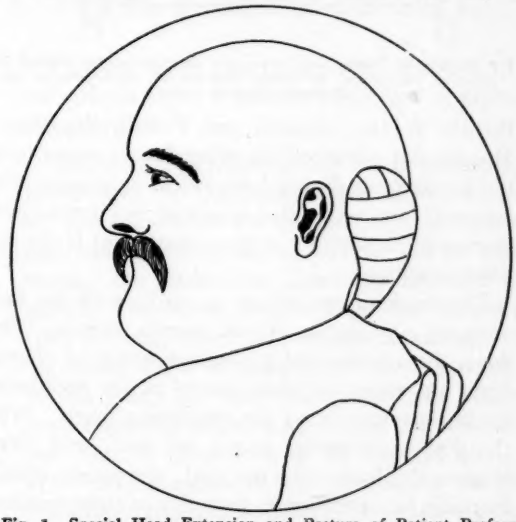

Fig. 1. Special Head Extension and Posture of Patient Preferred by Frazier for Operation on the Gasserian Ganglion and in All Craniotomies for Pretentorial Lesions.

Trendelenburg positions, is absolutely disastrous. More lately Bevan of Chicago and Teter of Cleveland, than whom no country has produced a better anethetist, have superseded the previous employment of chloroform and ether by narcosis induced and maintained by a combination of nitrous oxide and oxygen.

The Use of Morphine Has Been Abandoned.

Formerly it was customary on the part of operators to use morphine in conjunction with chloroform. This form of mixed narcosis has lately been almost entirely abandoned because the questionable advantage of *lessened vascularity* supposedly secured by the morphine, is offset by the opiate's uncertain action on patients in a comatose condition and by its depressant effects upon both the circulatory and respiratory apparatus.

The Perfected Chloroform-Oxygen Technic.

With the assistance of two such prominent anes-

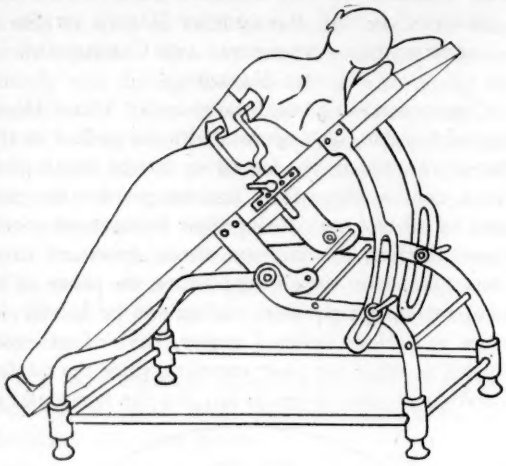

Fig. 2. Special Table and Device for Maintaining the Patient Inclined in the Lateral Recumbent Position for Operations on the Posterior Cranial Fossa.

thetists as Drs. Buxton and Powell, Sir Victor Horsley has perfected the chloroform-oxygen technic for narcosis during intracranial operations. The Vernon Harcourt inhaler, mounted on a conical base and supplied with an oxygen attachment is the apparatus utilized.

The mask of the inhaler is made to fit the face accurately by means of wet, aseptic towels. This done, the amount and percentage vapor of chloroform are under complete control of the anesthetist by the movements of the regulating lever. With the dose commencing at 0.5 per cent., and rising in several minutes to 2 per cent., the patient should be ready for operation in from five to eight minutes. If the initial narcosis is complete, no reflex vomiting will occur. If it be incomplete various untoward symptoms may arise. *The depth of narcosis should be regulated strictly according to the intensity of nerve excitation it is intended to obliterate.*

Two per cent. vapor is given for about five minutes before the incision of the skin and reflection of the flap, which constitutes the maximal pain period of the operation. This completed, the dose may be lowered to 1 per cent., while the bone is being removed. As the dura is a sensitive membrane supplied by the fifth cranial nerve, the dose should be somewhat raised, just previous to its incision, to prevent any reflex movements on the part of the patient.

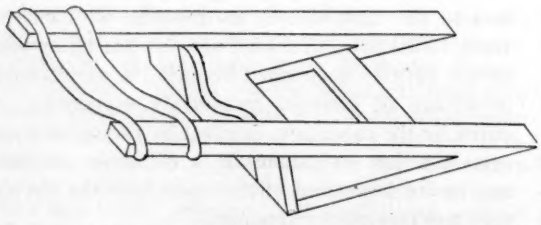

Fig. 3. A Device to be Placed Upon the Operating Table, for Sustaining the Patient in the Prone Position, With the Head and Chin Supported by the Straps, and Necessitating the Administration of the Anesthetic from Below.

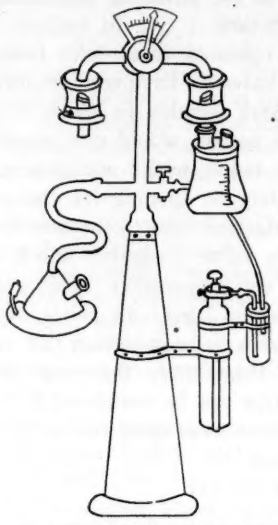

Fig. 4. The Vernon Harcourt Inhaler (Chloroform) Mounted on a Conical Base and Supplied With an Oxygen Attachment. The Lever Controls the Vapor Percentage from 0 to 2 Per Cent. of Chloroform in the Inspired Air.

As soon as the dura has been opened the encephalon may be explored without causing pain, except if the course of the fillet or one of the peripheral sensory nerves is accidentally irritated. Consequently all this part of the operation is done under less than 0.5 per cent. chloroform in the inspired air. In many cases, *if the edges of the wound are thoroughly protected by gauze,* the chloroform may be entirely discontinued. The longest period during which Horsley's anesthetists were able to do this was for twenty minutes, in operating upon a child for a cerebellar tumor, and for from twelve to fifteen minutes in the adult, after which time the return of reflex movements, necessitated the re-ad-

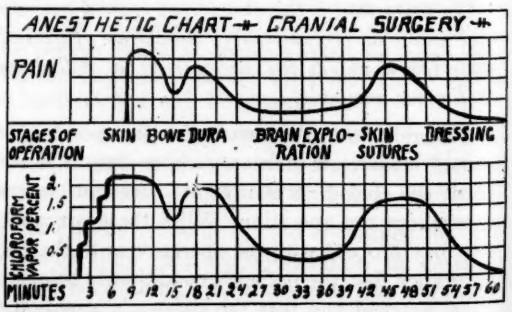

Fig. 5. Horsley's Conception of the Coincident Curves of Pain and the Percentage Vapor of Chloroform Required to Obliterate Nervous Excitation.

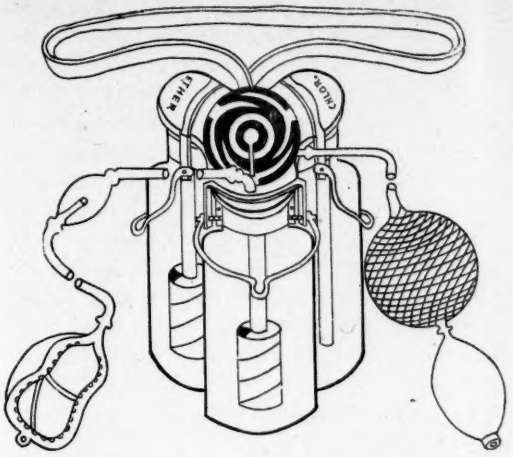

Fig. 6. The Gwathmey Inhaler for Chloroform and Ether, Separately or in Combination With Air or Oxygen.

ministration of the anesthetic.

After the encephalic lesion has been dealt with, the vapor should be increased to from 0.7 to 1 per cent., to provide for the insertion of skin sutures. This percentage is slowly decreased as the dressing of the wound is completed. Body-heat must be maintained throughout the course of the operation by means of the operating-table hot water bed or pans, and locally by irrigation with normal saline solution or mild bichloride (1-10,000) at a temperature of 115° Fahrenheit. The diagram shows the coincident curves of pain and chloroform vapor per cent., during the course of intracranial operations. (Fig. 5.)

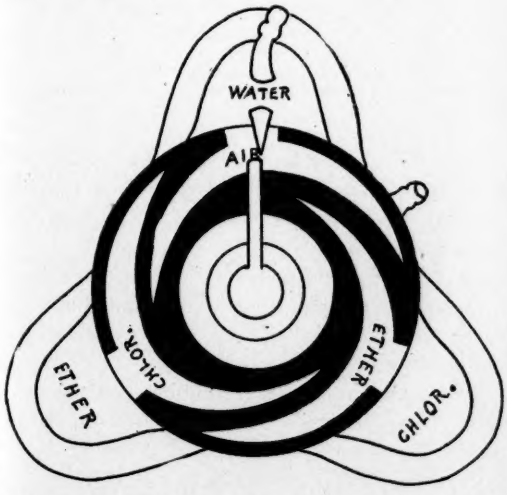

Fig. 7. Regulating Disc of the Gwathmey Inhaler. The Lever as It Moves the Disc Gives Any Combination of Air With Chloroform or Ether, or Any Combination of Ether and Chloroform. The Crescents Indicate the Rise and Fall of Vapor Percentage. Oxygen May Be Used at the Inlet Instead of the Air-Bulb, or it May be Attached Directly to the Mask.

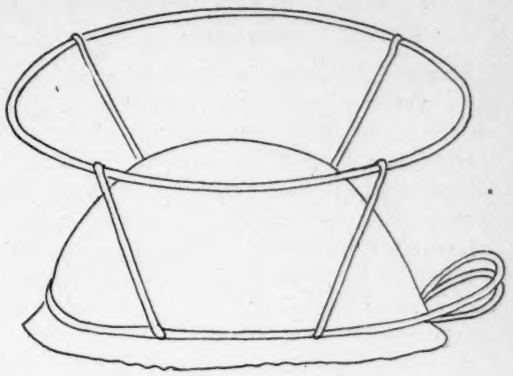

Fig. 8a. The Ferguson Double Chamber Mask for the Drop Method of Etherization. Inner Chamber of Gauze, from Six to Ten Thicknesses. The Lower Rim is Malleable Iron Wire so that it can be Adapted to the Contour of Any Face.

Oxygen, from 3 to 15 per cent. is added to the chloroform vapor to prevent congestive or asphyxial symptoms.

This technic of narcosis may also be perfectly followed with the Gwathmey vapor apparatus, using air and chloroform for the induction of anesthesia and adding the stream of oxygen for its maintenance. The mask of the Gwathmey apparatus is especially adapted to use upon the patient in any possible position, which is a distinct advantage. The regulating dial is so marked that the anesthetist can readily gauge his percentage vapor, the minimum percentage obtainable being 0.1 and the maximum 2 per cent. of chloroform in the inspired air. The ever-ready presence of the stimulating anesthetic ether is a convenient adjunct of this apparatus, since it permits the anesthetist to alternate from one anesthetic to another or to give both in any desired percentage by simply moving his lever.

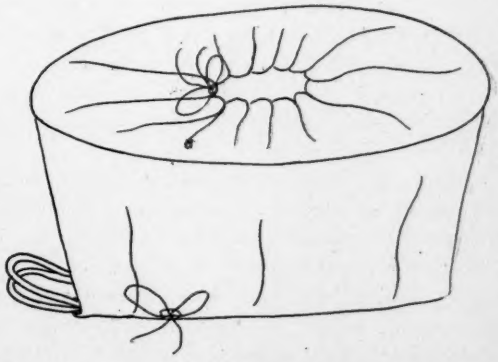

Fig. 8b. The Ferguson Mask, Outer Covering of Canton Flannel, Forming an Extra Air and Heating Chamber. The Opening in the Center Through Which the Ether is Dropped May be Changed to the Lateral Aspects of the Masks by Using Other Covers, Supplied With the Inhaler.

The Use of Ether During Intracranial Operations.

Ferguson, of Boston, has invented a mask for the drop method of etherization, which is of striking service in operations for pretentorial lesions. For operations on the posterior cranial fossa, the Gwathmey apparatus is much handier if the prone position is required by the surgeon. Frazier and Cushing use a light ether anesthesia induced and maintained by a closed cone, loosely applied, while hemorrhage is controlled by means of a Petit's tourniquet with an adjusting key.

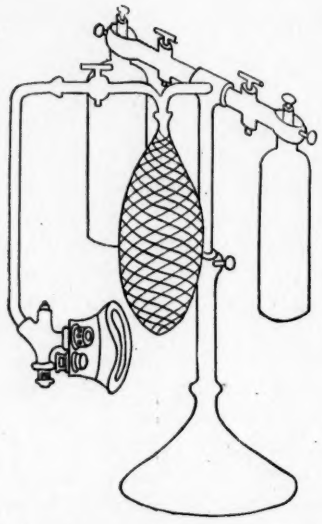

Fig. 9. The Simplest Form of Nitrous Oxide and Oxygen Apparatus, With a Mixing Bag and a Teter Face Piece. The Latest Teter Face Piece. The Latest Teter Device With Chloroform and Ether Attachments, a Warming Coil, Nose, Mouth and Face Pieces is Perhaps the Most Perfect Anesthetic Apparatus Now Obtainable.

The drop method of etherization for intracranial surgery has decided advantages over the closed cone method in that congestion and cyanosis are entirely obviated and an even light anesthesia may be maintained with one-third the quantity of ether otherwise used. These factors all redound to the increased safety of the patient.

When the Gwathmey apparatus is used, anesthesia should be induced by means of chloroform and air, and then gradually switched to ether, if any but the horizontal position is to be utilized, or to a mixture of chloroform and ether in such respective percentages as the abolition of reflexes and the stimulation of the patient necessitate. In using ether, alone or in combination with chloroform, the admixture of oxygen will render the narcosis immeasurably safer.

The Nitrous Oxide-Oxygen Technic.

The nitrous oxide-oxygen combination promises to prove an almost ideal form of narcosis for intracranial surgery. The apparatus used by Bevan and the more perfected device of Teter, give splendid results in the hands of an anesthetist accustomed to the use of this combination of gases. The one paramount advantage of this form of narcosis is that it may be utilized in cases of shock, collapse, coma and concussion in which no other form of inhalation anesthesia seems admissible.

The principles upon which Teter bases the success of his extensive experience with this combination, are:

(1) The physical properties of nitrous oxide are

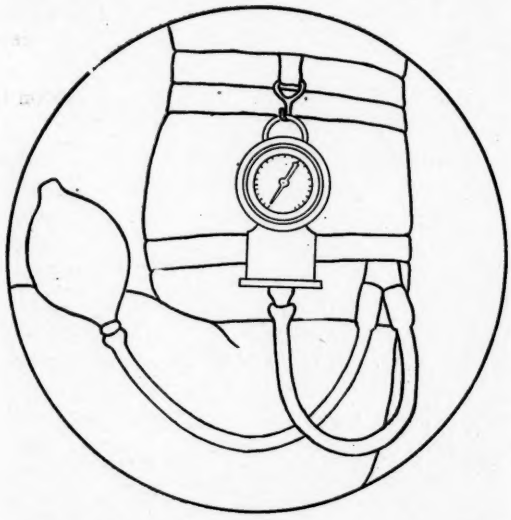

Fig. 10. A Reliable Sphygmomanometer, Which is Very Handy Because of the Manner in Which it can be Held in Position, Enabling the Anesthetist to Catch the Blood Pressure at Will.

such that it causes no decomposition of the nerve cells; nor do these cells lose any of their functional integrity, once the elimination of the narcotic agent has taken place.

(2) The coincident use of oxygen provides for an increased process of oxidation and thus anticipates and controls any circulatory or asphyxial complications.

When nitrous oxide is administered alone, as soon as the asphyxial element enters into the procedure, the brain loses its natural pinkish color and turns more or less gradually to a dark purple. If the administration is continued without air or oxygen, the brain takes on the appearance of stagnant blood. As this discoloration progresses, there is a proportionate dilatation of the brain, of such ex-

tent that occasionally the viscus will protrude through the opening of the skull. One can appreciate what this would mean to a patient with a myasthenic heart or one with an apoplectic tendency. This fact also accounts for the persistent headache complained of sometimes after an operation during which any of the general anesthetics have been *crowded*. The condition of the brain is altogether different when a patient is anesthetized with oxygen in combination with nitrous oxide.

During a craniotomy on a boy of ten, for the removal of an epidural clot, Teter decreased the oxygen percentage slightly for about five seconds, and noticed a pronounced asphyxial color and dilatation of the brain. An immediate increase of the oxygen supply to one-half the vapor percentage of the mixture resulted in a return to normal conditions in less than seven seconds. This rapidity of action certainly leaves the anesthetist master of circulatory and respiratory shock, in so far as this condition is controllable.

SAFEGUARDS AGAINST SHOCK AND STIMULANTS FOR COLLAPSE DURING INTRACRANIAL SURGERY.

The use of a reliable sphygmomanometer, with accurate preliminary control readings, is important for estimating the rise and fall of blood-pressure during the course of intracranial operations.

It may be of interest to know whether any stimulants are of service in the treatment of shock or respiratory failure. Aside from artificial respiration according to the method of Sylvester, amyl nitrite in five minim crushable pearls, and camphor in oil hypodermatically have alone proved of avail. Some hope is held out that faradic stimulation of the exposed cortical area may offer some help in disastrous collapse. In an operation on a boy paralyzed from the nipples down, by an impacted bone splinter against the cervical cord, the result of a bullet wound, the writer was able to counteract the pronounced shock of the chiseling and the respiratory inconvenience of the lateral prone position, by the use of three five minim pearls of amyl nitrite during the course of a forty-five minute chloroform narcosis.

Finally it may be of interest to record that a continental surgeon has utilized local anesthesia in the vault of the nasopharynx to secure a painless area in which to open the base of the skull through the sphenoid for hemorrhage consequent upon fracture. What future there may be for this form of analgesia will depend upon the daring of operators and the condition of the patient.

639 WEST SEVENTH STREET.

TECHNICAL POINTS THAT FURNISH THE BEST CURATIVE, FUNCTIONAL AND COSMETIC RESULTS IN MASTOID OPERATIONS FOR EXTRA-DURAL LESIONS.*

W. SOHIER BRYANT, A.M., M.D.,
NEW YORK CITY.

The surgery of the ear, as conducted by different operators, is characterized by a remarkable lack of uniformity in its results. The outcome of operative interference, in the author's opinion, will be safeguarded and improved by attention to the following points:

(a). The employment of a rigid aseptic technic should be fundamental to all the procedures of mastoid operations. The vital importance of this rigid asepsis is shown in the better results and in the more rapid convalescence in operations where the most careful asepsis has been maintained. By these aseptic measures the infection in the mastoid wound is lessened, in spite of the previous infection of the mastoid. The amount of the post-operative residual infection is also reduced very considerably by this strict asepsis. In many cases, the residual infection is diminished so that primary union of the wound takes place.

(b). The external mastoid wound should be closed as soon as possible, and with a minimum of drainage. In the cases where the aseptic technic has been successful, the external wound may be closed immediately, allowing primary union and obliteration of the wound cavity by blood clot.

When the asepsis is not sufficiently complete for an ideal result, a very small drain will allow sufficient drainage to permit the bulk of the wound to heal rapidly.

(c). The non-interference with the tympanic contents in the simple mastoid operations allows the ossicles to resume their normal function. Nothing is gained by probing or curetting about the tympanum.

(d). To facilitate the speedy healing of the tympanum, it is desirable to maintain the post-tympanic drainage until the tympanum is completely healed. The tympanum should be entirely healed before the post-aural opening is finally allowed to close. The quicker the tympanum heals, the less cicatricial tissue will form and the less will be the interference with the function of the tympanum.

(e). Beginning two or four days after the op-

* Read at the Sixteenth International Medical Congress, Budapest, August 29-September 4, 1909.

eration, Politzerization should be employed daily to insure tubal drainage. When the tympanic membrane is closed and the post-aural wound still open, Politzerization expels secretion from the tympanum in the direction of the mastoid wound. When the tympanum and post-aural openings are closed, Politzerization distends the tympanic membrane and lessens the danger of adhesion of the membrane and ossicles and the tympanic walls.

(f). The post-operative hearing is better in cases which do not undergo the radical mastoid operation; therefore, the radical operation should be employed only as a last resort.

The radical mastoideo-tympanic exenteration need not be performed unless it is absolutely necessary to remove diseased bone, or to uncover labyrinthine or intracranial complications. The radical mastoid operation should never be done for drainage of the middle ear cavities alone. The radical operation need not be done for uncomplicated suppuration, but only for acute or necrosing ostitis of the tympanic walls.

The technic of the radical procedure should be modified so that the living tympanic structures may be conserved as much as possible. Tympanic structures which are not necrotic beyond the possibility of resolution must be left in place. The preservation of the whole or a part of the tympanum serves to insure better post-operative hearing.

(g). Hearing after the radical mastoid operation is better in the cases where the Eustachian tube is preserved intact and patent throughout.

(h). In cases where labyrinthine operations are unavoidable, the cochlear mechanism need not be destroyed except where there are definite indications of suppuration of the cochlea. Leaving the cochlea intact, will preserve the post-operative hearing function of the unaffected ear.

The above points are illustrated, in the author's opinion, by the following case histories:

CASE I.—Boy, 6 years old. Ear discharged pus and patient had severe headaches. Operation, June 19, 1909, at New York Eye and Ear Infirmary. Mastoidectomy. Pus and softened bone found, extensive bone involvement. Streptococcus encapsulatus found in mastoid pus. The wound was completely closed after operation. Second day after operation the wound had entirely healed by first intention. Gauze in canal dry and tympanum healed. Hearing rapidly returned to normal. The good results in this case were due to (1) careful antiseptic technic, which allowed healing without suppuration in any part of the ear, or of the mastoid wound; and (2) the immediate closure of the mastoid wound to allow primary union.

CASE II.—A young woman, 19 years old. Had had recurrent purulent otitis. Slight mastoid pain and tenderness for 4 weeks. Operation at New York Eye and Ear Infirmary, January 19, 1906. Mastoidectomy including removal of mastoid process and cells. An epidural and perisinus abscess. Pacley meningitis and sinus phlebitis were disclosed. The sinus was uncovered from well back of the knee of the sinus to the jugular bulb. The sinus was covered with feeble granulations. A large area of bone was removed, uncovering a considerable area of dura mater in both fossæ. The wound was closed with sutures leaving a drain ⅛ inch in diameter, leading to the antrum. Drain removed on the third day. On the fifth day, the sutures were removed. The middle-ear had healed. The post-aural wound had healed. A 36-inch watch heard at 20 inches. Eleven months later there was no post-aural scar or deformity of surface. A 36-inch watch heard 11 feet.*

The good results in this case may be attributed to

(1). Careful asepsis which permitted rapid healing without suppuration in any part of the ear.

(2). Immediate closure of the mastoid wound with a minimum of drainage which prevented deformity and shortened convalescence.

(3). The preservation of the tympanic contents made possible the restoration of the post-operative hearing to normal.

(4). Rapid healing of the tympanum prevented the formation of thick cicatrices which would interfere with good hearing.

(5). The daily use of Politzerization prevented adhesion of the transmitting apparatus which might interfere with good hearing.

(6). The employment of the modified or drained blood clot dressing lessened the danger of destruction of the clot by infection.

CASE III.—Girl, 16 years old. Chronic purulent otorrhea three years. Pain in ear two weeks. Headache and dizziness one week. Mastoidectomy and tympano-mastoid exenteration. No ossicles found. Pus in antrum and cells. Bone sclerosed. Dura mater exposed over tegmen antri. Plastic flap cut in meatus. Mastoid wound closed. Small amount of gauze put in the meatus.

On the third day the mastoid wound had healed by first intention. By the 21st day the enlarged middle ear and meatus had wholly epidermatized. Post-aural scar linear, scarcely perceptible. Post-aural surface normal. Hearing poor but better than before the operation.†

* This case has been previously reported. Transactions of the American Otological Society, Vol. X, Pt. 2, 1906, pp. 354, and Vol. X, Pt. 3, 1907, p. 503.

† This case has been previously reported. "Rapid Convalescence After Mastoid Operation" (Case IV). *The Laryngoscope*, St. Louis, April, 1907, Vol. XVII, No. 4, pp. 273-277.

The good results in this case may be attributed to:

(1). Rigid aseptic technic.

(2). The immediate closure of the mastoid wound.

(3). The modification of the technic of the radical operation to preserve the lining of the tympanum as far as possible, reducing the area; which required the growth of new epithelium to cover it.

CASE IV.—A young woman, 24 years old. Chronic fetid purulent otitis since childhood. All tympanic contents appeared to be lacking. Rough bone felt in attic and aditus ad antrum. Tenderness on pressure over antrum. Temperature by mouth 99° F. Operation in a private hospital, September 14, 1904. Mastoideo-tympanic exenteration performed. Small cholesteotoma in the antrum. Dura mater uncovered in both fossæ. The membranous auditory canal was slit longitudinally and stitched back. The post-aural wound was closed. The meatus was lightly packed. The post-aural wound healed by first intention. The enlarged tympanic cavity and the meatus were dry in 5 days.

In 6 weeks the entire enlarged tympanic cavity was firmly epidermatized, and gross desquamation had ceased. Three years and 8 months later tympanum clean and normally discharged all desquamated epithelium. No post-aural scar or depression. A 36-inch watch heard 10 inches; hearing very much better than before the operation.*

The good results in this case were due to:

(1). Rigid aseptic technic which allowed convalescence without any post-operative suppuration.

(2). The immediate closure of the post-aural wound with a minimum of drainage to allow rapid healing.

(3). The modification of the technic of the radical tympano-mastoid exenteration to preserve all the living tympanic structures which hastened epidermatization and allowed a maximum of post-operative hearing.

(4). The preservation of the Eustachian tube intact, in order to insure the best possible post-operative hearing.

CASE V.—Boy, 19 years old. (Presented before the New York Otological Society, N. Y., May 28, 1907.) On the left side recurrent chronic middle-ear suppuration. Chronic mastoiditis. Five weeks previous to operation facial paralysis appeared. Occasional pain in left ear. Vertigo, nausea and vomiting commenced 2 weeks previous. Tendency to fall to the left, the diseased side. Loud tinnitus for the last 5 days in left ear. Examination showed total facial paralysis on the left, the diseased side. Left auricle displaced externally. Some post-aural redness and edema. No tenderness. A little pus in fundus of canal and perforation of membrana tympani. Temperature by mouth 99.4° F., pulse 104, respiration, 24. Deaf in diseased ear. No bone conduction in the affected ear. Tuning forks on any part of the skull are referred to the uneffected ear. High tone limit of the affected ear 52,000 S. V. Low tone limit 256 S. V.

Horizontal nystagmus most marked to the right, the well side, on looking to the right. Rotating eyes to the diseased side causes nystagmus, but not as marked as rotating away from the diseased side. On looking straight ahead very slight nystagmus in the eye of the affected side toward the well side. Cannot hop once with feet together and eyes closed without falling to the affected side.

Cannot walk three steps with eyes closed without falling to the left.

Tympano-mastoid exenteration at the New York Eye and Ear Infirmary, May 28, 1907. Mastoid sclerosed. Tympanum full of granulations. Removed ossicles. Granulation along the facial canal and in the oval pelvis. Uncovered facial nerve along the tympanic wall. Enlarged oval window; opened external semi-circular canal into vestibule. Made plastic flap of external canal. Closed post-aural wound. Light packing in canal.

Post-aural wound healed by first intention on second day. Third day no vertigo or tinnitus. Fifth day, middle ear practically dry. Ninth day jumped well with eyes closed. Still a little labyrinthine fluid could be wiped from enlarged oval window. Tenth day, facial movements much better. Twenty-fourth day, watch heard in operated ear by bone conduction. Thirty-ninth day labyrinthine fluid had ceased oozing.

Nine and one-half months later facial movement perfect. Equilibrium normal. A faint tremor of eyes on looking hard to either side. Politzer's accumeter heard at 21 inches on affected side.

Scar linear, and a level post-aural surface.*

The good results in this case were due to:

(1). Rigid aseptic technic which prevented post-operative suppuration in any part of the ear.

(2). The immediate closure of the mastoid wound hastened convalescence and diminished deformity.

(3). Not packing the enlarged tympanum tightly allowed as much closure of the added space as possible.

(4). Leaving the cochlea intact allowed some post-operative hearing.

CASE VI.—Man, 65 years old. Acute mastoiditis, right side. Ear ached for ten days previous. Constant headache. Nausea and dizziness. Mastoid tenderness. Fetid purulent discharge. Temperature by mouth 100.4° F. Operation at New York Eye and Ear Infirmary, May 21, 1907. Mastoidectomy, and mastoideo-tympanotomy or modified radical mastoid operation. Very extensive bone involvement and osteomyelitis extending to the jug-

* This case has been previously published. "The Technic of the Radical Tympano-Mastoid Operation When Complicated by the Anterior Position of the Sigmoid Sinus." *N. Y. Med. Jour.*, N. Y., Vol. 88, No. 15, April, 1908, pp. 751-754.

* This case has been reported previously. (New York Eye and Ear Infirmary Report, Vol. XIII, July, 1908, p. 24, Case 4.)

ular fossa of the occipital bone and the zygoma and the petrous pyramid. The dura mater was extensively exposed. The posterior wall of the osseous meatus was removed up to the sulcus tympanicus. The epitympanum was widely opened, exposing the incus and malleous, but their attachments were not disturbed. The mastoid wound was closed around a very small drain ⅛ inch in diameter. The infection found in the mastoid pus was streptococcus encapsulatus. Convalescence. Post-aural wound healed by the fourth day. Eighth day tympanum dry. Tenth day tympanic membrane healed. On the twenty-fifth day everything was solidly healed. Nine months after the operation a 36-inch watch was heard 17 inches. This was better than before the ear involvement. Right or normal ear heard the watch only at 10 inches. Patient says that the left ear was the better hearing ear before the acute attack and operation, and that now the operated ear hears very much better than before the operation. Scar linear. Slightly depressed post-aural surface.*

The good results of this case are due to:

(1). Careful antiseptic technic, which allowed rapid convalescence without suppuration in any part of the ear; a minimum of injury to the sound-conducting apparatus, causing an improvement in hearing in an old man.

(2). Immediate closure of the post-aural wound, contributed to the cosmetic result and short convalescence.

(3). Non-interference with the tympanic contents in the modified radical operation of mastoidectomy and mastoideo-tympanotomy allowed a post-convalescent hearing greater than the pre-infection hearing.

(4). The use of Politzerization prevented the adhesion of the sound-transmitting mechanism which might interfere with post-operative hearing.

(5). The modification of the technic of the operation to furnish a maximum exposure of the tympanum without injuring the sound-conducting mechanism, allowed the restoration of a large amount of hearing.

CASE VII.—A lad, 17 years old. Chronic middle ear suppuration of the left ear. An acute attack had lasted six weeks. Auricle displaced outward by post-aural swelling. Modified radical or mastoidectomy and mastoideo-tympanotomy performed at the New York Eye and Ear Infirmary, July 27, 1905. Case presented before the New York Otological Society, November 28, 1905. Operation showed perforation of the cortex, and very extensive bone involvement. The mastoid process and cells were entirely removed. Dura mater was exposed in middle and cerebellar fossæ. The posterior wall of the osseous meatus was removed, close up to the sulcus tympanicus. The upper wall of the meatus was removed, leaving only the inner table. The outer and lower walls of the epitympanum were taken away. The body of the incus and head of the malleus were clearly seen. The ossicles and their attachments were not disturbed. The external meatus was slit longitudinally along the floor, the cut turning up backwards into the concha. The external wound was closed tightly and allowed to fill with blood. The meatus was lightly packed. At operation, a mixed infection was found in the mastoid pus. On the eleventh day after the operation the middle ear, canal and mastoid wound were healed. Two and one-half years later, a 36-inch watch was heard by the left ear at 8 feet—very much further than before the operation. The post-aural surface normal. The linear C-shaped scar is barely perceptible.*

The good results in this case were due to:

(1). Rigid aseptic technic which prevented post-operative suppuration in every part of the ear, and allowed restoration of normal hearing.

(2). Immediate closure of the external wound furnished good cosmetic results.

(3). The daily use of Politzerization prevented adhesion of the sound-conducting apparatus and assisted the restoration of hearing.

(4). The performance of a modified radical operation or mastoidectomy and mastoideo-tympanotomy for extensive involvement of the temporal bone, allowed the retention of the function of the sound-conducting apparatus.

CONCLUSIONS.

Strict attention to the following points has given the best cosmetic functional and curative results in mastoid operations:

(1). The employment of rigid aseptic technic.

(2). The immediate closure of the external wound with a minimum of drainage.

(3). In a simple mastoid operation, the non-interference with the tympanic contents.

(4). The healing of the tympanum before the post-aural opening is finally allowed to close.

(5). The daily use of Politzerization, beginning three or four days after the operation.

(6). The performance of a radical operation only in cases which demand it; and the modification of the technic of the radical procedure so that all the living tympanic structures may be conserved.

(7). The preservation of the Eustachian tube intact and patent throughout.

(8). Leaving the cochlea intact, except in cases where there are definite indications of an invasion of the cochlea by suppuration.

* This case has been published. New York Eye and Ear Infirmary Report, Knickerbocker Press, N. Y., Vol. XIII, July, 1908, p. 24, Case XXIII.

* This case has been reported previously. *Archives of Otology*, N. Y., Vol. XXXV, No. 1, 1906, p. 88, and No. 4, 1906, p. 198.

BIBLIOGRAPHY.

The Mastoid Operation; Indications for and Results from Its Employment. *N. Y. Med. Jour.*, June 29, 1907, vol. lxxxv, No. 20, 1212.

A Case of Streptococcus Encapsulatus Aural Infection, and Modified Radical Mastoid Operation. *Archiv. of Otol.*, N. Y., Feb., 1908, vol. xxxvii, No. 1, pp. 69-72.

Exhibition of a Patient Operated on for Mastoiditis, Complicated by Epidural Abscess. *Trans. of Amer. Otol. Soc.*, New Bedford, 1906, vol. x, pt. 12, pp. 354-355.

Epidural Abscess. *The Post-Graduate*, New York, June, 1905, vol. xx, No. 6, pp. 591-592.

Rapid Convalescence After Mastoid Operation. *The Laryngoscope*, St. Louis, April, 1907, vol. xvii, No. 4, pp. 273-277.

The Preventive and Abortive Treatment of Mastoiditis. *The Antiseptic*, Madras, India, Jan., 1907.

Report of All the Mastoid Operations Performed by the Author at the New York Eye and Ear Infirmary, in 1907, pub. in *N. Y. Eye and Ear Infirmary Report*, vol. xiii, July, 1908.

Results in Improved Technic in Otologic Surgery. *Jour. Am. Med. Assn.*, Chicago, Jan. 19, 1907, vol. xlviii, No. 3, pp. 200-205.

The Radical Mastoid Operation, Modified to Allow the Preservation of Normal Hearing. *Trans. Am. Otol. Soc.*, New Bedford, 1906, vol. x, pt. 2, pp. 292-295.

Operative Technic and After-Treatment for Mastoiditis with Epidural Complications. *Med. Record*, N. Y., March 31, 1906, vol. lxix, No. 31, pp. 502-505.

Technic of the Radical Tympano-mastoid Operation when Complicated by the Anterior Position of the Sigmoid Sinus. *N. Y. Med. Journ.*, April 14, 1906, vol. lxxxiii, No. 15, pp. 751-754.

Mastoideo-tympanotomy: The Operation of Election for Persistent Otorrhea and Acute Mastoideo-tympanic Ostitis. *Post-Graduate Quadri-Centennial*, 1908, New York.

Short and Easy Methods of Arriving at Good Results in Diseases of the Ear and Upper Air Tracts, Illustrated by Recent Cases. *Med News*, N. Y., vol. lxxxvi, 1905, p. 393.

The Conservation of Hearing in Operations on the Mastoid Region. *Boston Medical and Surgical Journal*, March, 1907, vol. clvi, No. 10, p. 300.

Results of Improved Technic in Otological Surgery. *Journal of the Am. Med. Assn.*, Chicago, vol. xlviii, 1907, pp. 200-205.

Le Caillot Modifie dans la Chirurgie de la Mastoide. *Archiv. Internat. de Laryn. d'Otol. et de Rhin.*, Paris, Sept., Oct., 1906, vol. xxii, No. 2, pp. 501-504.

The Radical Mastoid Operation Modified to Allow the Preservation of Normal Hearing. *N. Y. Med. Jour.*, vol. lxxxiv, 1906, p. 780.

Report of a Case with Hysterical Symptoms Upon Whom the Mastoideo-tympanic Operation Was Done. Both sphenoidal sinuses were opened and partial turbinectomy performed upon three turbinates besides much local treatment. *Am. Jour. of Surgery*, N. Y., Sept., 1906, vol. xx, No. 9, pp. 279-280.

Some Modifications in the Operative and After-Treatment of Mastoiditis. *N. Y. Eye and Ear Infirmary Report*, N. Y., 1906, vol. xii, pp. 81-91.

Modified Blood Clot in Mastoid Surgery. *Annals of Otol., Rhin. and Laryn.*, St. Louis, 1906, vol. xv, No. 3, pp. 489-492.

The Technic of the Complete Mastoid Operation, Improved, Shortened and Simplified Through the Digastric Route. *Annals of Otol., Rhin. and Laryn.*, St. Louis, Dec., 1907, vol. xvi, No. 4, pp. 871-872.

The Conservation of Hearing in Operations on the Mastoid Region. *Annals of Otol., Rhin. and Laryn.*, St. Louis, 1907, vol. xvi, No. 1, pp. 32-36.

Two Cases of Otitis Media Catarrhalis Chronica, Showing Improved Hearing After Acute Mastoiditis Treated by Operation. *Internationales Zentralblatt f. Ohrenheilk.*, vol. vi, No. 2, Nov., 1908, p. 74.

Rapid Convalescence after Mastoid Operations. *The Laryngoscope*, St. Louis, April, 1907, vol. xvii, No. 4, pp. 273-277.

A Case of Mastoiditis and Epidural Abscess. Operation and Rapid Recovery. *Trans. Am. Otol. Soc.*, New Bedford, May, 1907, vol. x, pt. iii, pp. 503-509.

41 EAST THIRTY-THIRD STREET.

VENOUS STASIS AS A THERAPEUTIC MEASURE.*

ADOLPH BONNER, M.D.,

Assistant Surgeon to the New York Post Graduate Hospital Dispensary,

BROOKLYN, NEW YORK.

Rokitansky's assertion, based upon his wide experience in pathology, that lung tuberculosis rarely coexisted with pulmonary engorgement such as would arise from mitral insufficiency, suggested to Dr. August Bier the applicability of artificially induced venous stasis in the treatment of tuberculous joint affections.

Prof. Bier's work covers a period of over fifteen years, during which time this method has not only proven of great value in the treatment of tuberculous joints, but also its sphere of usefulness has been extended and found fully adapted for treating various forms of acute and chronic arthritis and inflammation of the soft tissues.

In order to better understand the theories by which the action of the venous stasis is explained I will mention in passing that venous stasis is induced by applying a rubber bandage proximal to the diseased area; the constriction being just enough to impede the return flow. This causes the skin on the distal side to become bluish in color. This phenomenon might well be termed the "objective reaction."

On further analysis of what occurs in consequence of this reaction it will be found that a backward pressure occurs affecting the arterial circulation by retarding it, which in turn causes dilatation of the arterial vessels, indirectly establishing an active hyperemia. Thus, not only is a passive hyperemia established, but there is combined with it an active hyperemia, two conditions facilitating the transudation of serum and diapedesis of leucocytes into the surrounding tissues. This secondary reaction I term "circulatory reaction."

The transudation of serum flushes the parts, physically diluting the bacteria and their toxins, preventing their concentrated action and thereby lessening their power of injuring the tissues they invade. This dilution also facilitates destruction and elimination by the excretory organs.

The more important function exercised by the serum is by its inherent power of inhibiting the growth of bacteria and chemically counteracting their toxins. The function of the white cells termed phagocytosis is so well known that I only mention

* Read before the Williamsburg Medical Society, Brooklyn, N. Y.

it as a reminder of one of the various ways in which bacteria are gotten rid of.

The migrated leucocytes act by walling off the diseased area, limiting its extension by continuity, and acting as a barrier to the further invasion of normal tissue by bacteria, thus depriving them of new culture media. When such walling off process is completed, the disease becomes quiescent, which encourages lime deposits and thus may the obliteration of an abscess cavity be explained. The increased pressure in arterial hyperemia facilitates a freer dissolution of the oxygen from the blood through vessel walls into the surrounding tissue, thus aiding the destruction of bacteria and rejuvenating the tissue cells and so fortifying them against bacterial invasion.

Although the above do not include all the theories advanced, they afford a fair insight into the theories upon which the treatment is based.

I wish to call attention to a few important points in the technic.

(a) The area distal to the constricting bandage should never appear white. When this occurs it indicates that the constriction is too severe and that arterial circulation has been interfered with.

(b) Increase of pain in the affected part during the treatment must never occur. The importance of recognizing this will be more apparent when I state that in actual practice amelioration of pain is one of the earliest evidences of the beneficial effects of this treatment. Complaints by the patient should be needed and the cause looked for. Pain will be found most often due to the bandage being too lightly applied or too near the diseased area; more rarely it might be due to an acute abscess forming.

(c) Constriction should not be applied too near the diseased area, but well outside its limits.

CITATION OF CASES.—The following cases have been chosen as representative types. CASE I is that of a tuberculous elbow joint in a fireman, 54 years of age, in whom venous hyperemia gave relief from pain after two weeks. He was under treatment for about six months, at the end of which time the cure was effected with full restoration of the joint movements, so that upon a re-examination by the fire department surgeon the man was permitted to take up his former active work.

CASE II is that of a tuberculous right wrist-joint in a tailor aged 38. The treatment was applied for ten months, resulting in full restoration of function and resumption of work.

CASE III is that of a tuberculous left elbow in a woman of 25; the trouble had started about four months before she presented herself for treatment. All the typical symptoms of the disease existed. Four weeks after the treatment was begun pain was entirely relieved, other symptoms subsiding proportionately, so that at the end of ten months she had almost complete flexion and extension, with slight impairment of pronation and supination. The general systemic condition also improved much.

CASE IV. Gonorrheal arthritis of the left knee developed in a man of 62, three weeks after primary infection. He entered the hospital for the treatment of the knee affection, where he remained for four weeks, and there was treated by the ordinary methods. Upon leaving the hospital he came to me. Upon examination, I found his somewhat enlarged knee still painful on deep pressure and the leg flexed to an angle of about 45°. This was no doubt due to the organization of the effused inflammatory products. I employed venous stasis for five weeks without recourse to any other measure. The patient was discharged with a perfectly useful limb.

CASE V. Diagnosticated as hydrops of the left knee following grip infection in a man 66 years old who was under treatment from the very start of the disease. I applied all the well-known remedial agents topically and internally for a period of three weeks, with no abatement of the symptoms, which caused me to call in a colleague, who advised surgical interference. This being refused, venous stasis was employed, with the result that about four hours after applying the bandage pain was so ameliorated that the patient for the first time felt comfortable. This treatment extended over a period of three weeks, at the end of which the patient attempted to walk first with the aid of crutches. In an hour and a half from the first attempt to walk he was able to cross the room unaided. The patient has been and is to the present day under my personal observation, and has not had any further trouble with the knee.

CASE VI. Gonorrheal arthritis of the right knee in a man of 28 years, following urethral infection. The signs of the disease were fully developed when I saw him two days after the first symptoms calling attention to the knee. I employed venous stasis for three days, and the treatment gave such marked relief that the patient, who is a traveler, left town much against my advice the fourth day after treatment had been instituted, or about the sixth day after the disease showed itself. I have seen this patient at various times in the two years that have elapsed since the onset of the disease and he has told me that he felt no further trouble.

I could cite more cases. I wish to state, how-

ever, that all other cases coming under the same category as the above have shown the same marked improvement under this method of treatment.

It is worth calling attention to the fact that splints were never used in conjunction with this treatment and that their use is strongly discouraged by those whose experience is extensive. In support of the advisability of discarding splints, the fact is pointed out that functional restoration exists when the disease has been cured. The rather prompt relief from pain obviates the necessity of splints, and at the same time patients are strongly encouraged to use passive and active motion. In making passive or active motion it should never be carried to the point of producing pain, such forcible motion being productive of harm.

I shall not in this short paper mention the effects of this treatment in other than joint diseases.

The untoward effects of Bier's treatment are few. In my experience there has been but one instance, viz.: in one case an acute abscess supervened upon a tuberculous arthritis of the wrist, which was aspirated and injected with iodoform and glycerine emulsion. This was repeated two or three times with the final abatement of the trouble. The latest writings of Prof. Bier fail to show the occurrence of any untoward effects, and he states that such a condition as that I have just described need not cause one any great worry.

Although this treatment is by no means a panacea for all ills, it is a remedial agency of very great value, and it deserves the earnest consideration of the profession at large.

CONCLUSIONS.

1. The length of time Bier's hyperemia has been employed puts it beyond the experimental stage, and it must be considered as a standard therapeutic measure.

2. The theories advanced in explanation of its action seem logical. The treatment is founded on scientific principles.

3. The materials used for the treatment are easily procured and their cost is nominal.

4. The technic, though requiring skill and care, may be learned by diligent application.

5. The carrying out of the treatment, which may at times extend over a long period of time, may, after a while and with special instruction, be left in the hands of the patient, with only periodical supervision by the attending physician.

6. The beneficial effects of the treatment can be measured early in its use.

7. It greatly decreases the liability to ankylosis.

421 GRAND AVENUE.

REMARKS ON THE EARLY DIAGNOSIS AND REMOVAL OF THE CANCEROUS WOMB. ILLUSTRATIVE CASE.

C. W. STROBELL, M.D.,
Attending Surgeon, Rutland City Hospital,
RUTLAND, VT.

This patient was forty-five years of age, and had not reached the menopause. She had always been regular with her menses. Twenty-four years ago she gave birth to her only child. She had always been well with the exception of a constant leucorrhea, and occasional backaches and pains in the groins, which were somewhat aggravated during the menstrual periods.

Six months ago she began to have excoriating vaginal discharges which caused a chronic vulvovaginitis rendering her life very miserable, and finally impelling her to seek professional advice. She gave no history of uterine hemorrhages or menorrhagia. Examination showed a highly inflamed vulva and vagina, involving the adjacent integument on the inner aspect of the thighs. The perineum presented a second degree laceration; the cervix deep bilateral commissural lacerations, with extreme eversion and erosions. The fundus was enlarged and somewhat boggy, but in good position; the ovaries and tubes somewhat tender but not enlarged.

Curettage was performed, but because of the suspicion of malignancy, based on induration of the servical tissues, further operative procedures were temporarily suspended, pending the pathologist's report.

This report corroborated my suspicions. The patient was therefore relieved of her uterus and adnexæ, employing the clamp method, by the vaginal route. She was dismissed from the hospital three weeks later in fine condition, having made a smooth recovery. The vaginal route was chosen for the following reasons: The adhesions were not extensive, and could be broken without great difficulty. The uterus was not especially enlarged, and by the use of the clamps pushed far out laterally on the broad ligaments, much more infected tissue could be removed than was possible by ligature, as the tissues in the bight of the clamps would slough away,—which latter was the main reason why the clamps were used. In addition to this were other considerations that always incline me to the vaginal operation, in suitable cases,—namely, less shock; less danger of intestinal paresis, because of avoidance of handling the intestines; natural drainage, when drainage is indicated; speedier con-

valescence, and when the clamp operation is employed no ligatures to come away, and no sutures to infect. The operation can be done much more expeditiously than by the suprapubic route. Post-operative pain is less and the abdominal wall is left intact.

The lesson that has again been brought home to me in this case, is that of the importance and of the ease of early detection of these cases, if we are but alert. As a rule, these women have been more or less under the doctor's care, affording ample opportunity for early diagnosis, provided the attendant is qualified and faithful in the discharge of his duty. Instead of wasting valuable time in obsolete tamponading methods, the surgeon should be called into the case. Together, the physician and the surgeon would, in the course of their work, collect such specimens of different parts of the suspected tissues as are needed for a pathological examination. Thus far, and in this manner, no time will be lost, and what will have been done by the surgeon, usually a curettage, would be at the same time the only effective and rational procedure indicated, as a first step, toward the restoration of the patient to health.

Endometritis, in one of its various forms, invariably accompanies disease of the reproductive organs, and is almost invariably as well the source of systemic infection and resultant debility; and this because of the richness and abundance of the lymphatics lying in clusters and chains in the bases of the broad ligaments and in the uterine walls. This absorption is not of the fluids exuded into the uterine cavity, but of the septic products of inflammation in the submucous tissues and lymphatics, which cannot drain into the uterine cavity, but must be relieved, by absorption and entrance into the general circulation, for distribution to the eliminating organs. Hence this condition always needs attention, and always, if the endometritis is not cured there will be no real improvement. Viewed in this light, does it not seem to be the only rational procedure? In my recent statistical paper, read before the Vermont State Medical Society, in October last, I outlined a "Cancer Quartette" of early objective symptoms, namely, *Hemorrhage, Induration, Discoloration, Ulceration*. But, even before any of these symptoms are obvious, we must be suspicious of every case of persistent purulent, excoriating, or bloody leucorrhea; especially in case of a cancerous family history; or a possible infection from residence in a house in which any kind of a cancer case had ever occurred; or where the care of, or contact with, any cancerous case is suspected, even going back ten years or more,—for if anything is proven regarding the infectiousness of cancer it is that the period of incubation is long, and that the disease, in its progress, gathers momentum, and finishes in a rush. According to the statistics above referred to, there are approximately fifty incipient, and fifty advanced cases of uterine cancer, in Vermont to-day, rushing on to their doom. Most strongly to be commended to your attention, is the intensely interesting, and highly important contribution to the literature, of the infectiousness of cancer, by Dr. A. L. Tynes, in the *Journal of the American Medical Association*, March 21, 1908, on "The Epidemic Occurrence of Cancer, in Fishersville, Virginia, and Vicinity."

The plan of procedure outlined above, in the class of cases under discussion is the more important considering the difficulty of ascertaining in any other way, cases of uterine cancer, starting in the fundus. All such cases do not begin with hemorrhage—indeed hemorrhage is a late symptom in cancer of the fundus, as is "spotting" in cancer of the cervix. Ulceration or erosion must, in every instance, precede such bleedings, and when ulceration does occur the disease is well on the way, just as in carcinoma of other organs of the body. It will not do to wait for hemorrhage. On the contrary the physician should act promptly in every case of purulent, odorous or excoriating leucorrhea, by calling in the surgeon,—primarily to ascertain whether cancer exists, and secondarily to take promptly the first important steps in the restoration of the patient to health. In exact proportion to the earliness of the diagnosis, will be the chances against recurrence, just as in cancer affecting any other portion of the body.

The vaginal route has been objected to on account of the difficulty of avoiding the ureters, which run close to the sides of the cervix, in their course to the under surface of the urinary bladder; but with a careful selection of cases suitable for this method, an intimate knowledge of the anatomical relations, as well as of the proper technic, one may easily avoid these important structures. Although I have performed the vaginal operation many times in the past ten years, I have yet to be unfortunate enough to damage these tubes. Should such a complication arise, however, the abdomen must be promptly opened and the involved portions of the ureter either anastomosed, or the mesial end may be drawn through a *per urethram* perforation of the posterior superior bladder wall, and sutured there.

23½ MERCHANTS' ROW.

AN AUTOMATIC DEVICE FOR PROLONGED INTERMITTENT FLUSHING.

ARTHUR J. BENDICK,
Interne, Mt. Sinai Hospital,
NEW YORK CITY.

This apparatus is designed to facilitate prolonged irrigation as indicated in septic conditions of the extremities or other parts of the body.

Continuous irrigation, as usually arranged, has the disadvantage that the flow is usually slow, and the solution merely trickles down in a few paths, so that there is little if any flushing out of the affected part. By means of the device to be described, the solution enters the parts in periodic

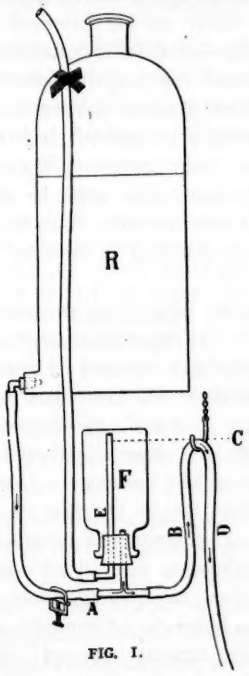

FIG. 1.

sudden gushings which completely flush out all accumulations.

A large reservoir (R), is placed at a sufficient height above the bed to insure a forcible flow. The "interrupter" (F) is placed midway between the levels of the reservoir and bed. An "interrupter" can readily be made by taking any bottle having a rubber stopper with two openings. Through one opening a glass tube long enough to reach to the bottom of the bottle is fitted. Through the other opening a glass T-tube is inserted, passing just through the stopper. The bottle is then inverted. To the long tube, rubber piping is attached and carried above the level of the reservoir, opening freely to the air. One arm of the T-tube is connected with tubing to the reservoir. The third arm of the T-tube is also connected to rubber tubing (B), which latter curves upward to a point (C) about one-half inch below the level of the highest part of the bottle (F), at which point it curves downward again and is attached to the tubing which passes to the wound. The latter, of course, may enter the tissues by one or by several outlets.

The solution from the reservoir (R) enters the T-tube at (A) and rises simultaneously in the bottle (F) and the tube (B). When the level (C) is reached the water passing around the curve fills the tube (D) and this establishes a syphon action which empties the bottle (F) with a rush, air being admitted to the bottle through the tube (E). When the bottle has been emptied, air is drawn into the rubber tube (B-D) and thus the syphon action is

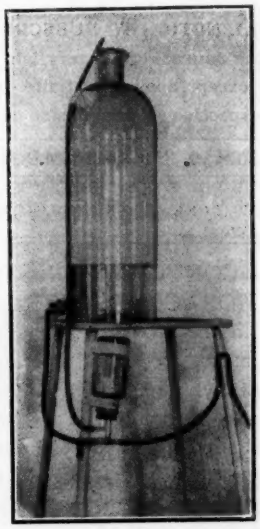

FIG. 2.

broken. The solution then commences to fill the bottle and rubber tube (B), and the cycle is repeated. By regulating the flow at (A), with a clamp the interval between flushings can be accurately adjusted.

The advantages of this arrangement over continuous irrigation are:

1. More complete cleansing of the part.
2. Less consumption of solution, hence less labor to keep the apparatus working.
3. More tonic, stimulating effect from the intermittent douching than from a continuous flow.

The apparatus as here described can be made with materials obtainable in any sick room. While it may be slightly simplified by a special bottle and tubing its efficiency would hardly be increased. The device has been thoroughly tested in the surgical service of Dr. Lilienthal, at Mount Sinai Hospital, and its value has been proven.

American Journal of Surgery

PUBLISHED BY THE

SURGERY PUBLISHING CO.

J. MacDONALD, Jr., M.D., President and Treasurer

92 William St., N. Y., U. S. A.

to whom all communications intended for the Editor, original articles, books for review, exchanges, business letters and subscriptions should be addressed.

SUBSCRIPTION PRICE, ONE DOLLAR FOREIGN, SIX SHILLINGS

Original Articles and Clinical Reports are solicited for publication with the understanding that they are contributed exclusively for this journal.

It is of advantage to submit typewritten manuscript; it avoids errors.

CHANGE OF ADDRESS. Subscribers changing their addresses should immediately notify us of their present and past locations. We cannot hold ourselves responsible for non-receipt of the Journal in such cases unless we are thus notified.

ILLUSTRATIONS. Half-tones, line etchings and other illustrations will be furnished by the publishers when photographs or drawings are supplied by the author.

SPECIAL NOTICE TO SUBSCRIBERS

The "American Journal of Surgery" is never sent to any subscriber except upon a definite written order. Present and prospective readers please note this.

WALTER M. BRICKNER, M.D., Editor

NEW YORK, FEBRUARY, 1910.

MELTZER'S CONTRIBUTION TO INTRATHORACIC SURGERY.

Very early in the study of the surgery of the chest it was ascertained that operative work in the pleural cavity would not advance until one problem was solved—the avoidance of pneumothorax and the coincident collapse of the lung when the pleural cavity is widely opened. Mikulicz placed this problem before his pupil, Sauerbruch, with the result that the latter devised an ingenious cabinet in which the negative air pressure normally present in the pleural cavity was substituted. In this cabinet the subject's body was placed—his head and neck protruding beyond it—and in it the operator and his assistants worked. Pneumothorax and collapse of the lungs did not occur when the pleural cavity was opened. Not long after, Brauer conceived the idea of placing the subject's head and neck alone, in a positive air pressure cabinet, in order to achieve the same result as Sauerbruch. This he did, and with a much less cumbersome apparatus. Recently, Willy Meyer devised a cabinet, by means of which he is able to combine, or to alternate between, positive and negative pressures. These various solutions of the problem have been great advances in intrathoracic surgery, permitting types of operations that were, before, only dreamt of.

But it remained for Meltzer, working at the Rockefeller Institute, to discover what appears to be the true physiological principle underlying respiration with an open pleural cavity. And like most important principles, it is exceedingly simple.

At the last meeting of the American Medical Association Meltzer reported, and he and Auer have recently published in the *Journal of Experimental Medicine*, xi, 1909, the discovery that if a tube is introduced into a dog's trachea too near its bifurcation, and a continuous stream of air is run through the tube, the lungs will be perfectly ventilated without the animal drawing breath. The principle is the very old one of diffusion of air currents. With the tube's diameter about half that of the trachea, egress of the air from the lungs is provided. With an air pressure of about 20 mm. of mercury—crudely obtainable with an ordinary foot-bellows—the lungs remain distended and pink, when both pleural cavities are laid wide open. The animal rests quietly, and the heart beats normally, when, even for hours, there has been no effort at respiration. If a bottle of ether is placed in circuit with the air tube narcosis proceeds so nearly automatically that it requires but little attention.

It is easy to see what great practical significance there may be in this important experimental contribution to intrathoracic surgery. Already Carrel has reported (*Journal of the American Medical Association*, January 1, 1910) his successful employment of Meltzer and Auer's method for operations on the thoracic aorta, of dogs. (See abstract in this issue.) That this is the first of what will be a long series of experimental studies which shall lead to the application of Meltzer's method to the human being, there can be little doubt. There seem to be numerous practical advantages of the method over the various cabinets devised. Should this, in practice, be found untrue, we shall nevertheless always honor the eminent physiologist who has discovered a profoundly interesting new principle of respiratory exchange.—H. N.

GASTRO-ENTEROSTOMY FOR NON-OBOBSTRUCTIVE LESIONS.

The curative and remedial value of gastro-jejunostomy for lesions obstructing the pylorus is definitely established. Its service in the presence of the same lesions, benign and malignant, situated at portions of the stomach other than the pylorus, is debatable.

That some cases of non-obstructing chronic ulcer and cancer are relieved by gastro-enteric anasto-

mosis is probably to be accepted, but whether this is accomplished by securing some measure of rest for the diseased area or by the admission to the stomach of the alkaline secretions from the duodenum, or otherwise, is by no means clear.

That there is considerable difference of opinion and much uncertainty concerning the propriety of performing gastro-enterostomy for carcinoma and chronic ulcer not obstructing, nor threatening to obstruct, the normal outlet of the stomach, a reference to two recent standard works will show. Moynihan (*Abdominal Operations*) says of carcinoma:

"If no obstruction is caused, gastro-enterostomy is not indicated, and will not give, if performed, a degree of relief commensurate with the risks of the operation, though some temporary improvement may be noted."

While for ulcers on the lesser curvature, away from the pylorus, and not causing obstruction, he considers excision the proper procedure, when possible. Deaver and Ashhurst (*Surgery of the Upper Abdomen*, Vol. I, 1909) say:

"We cannot entirely accept his [Moynihan's] condemnation of gastro-jejunostomy for ulcers elsewhere than in the pyloric region of the stomach. The patient may not be so markedly benefited as in the presence of pyloric ulcer; but considerable improvement, if not immediately at least ultimately, we think is to be anticipated."

For non-obstructing cancer Deaver believes "that gastrectomy is best reserved for those cases in which it seems likely that it will be a curative operation," and he strongly inclines to the belief that gastro-enterostomy prolongs life in these cases.

Animal experiments and laboratory observations are not always in correspondence with bedside experiences. But concerning the value of gastro-jejunostomy the recent article by Cannon (*Boston Medical and Surgical Journal*, November 11, 1909), whose experimental observations, and Blake's, have had an important bearing on the development of this problem, seems very pertinent. He says:

"According to physiological observations, there is no alteration of peristalsis because of a new opening being made midway in the stomach. The notion which has been expressed by some surgeons that such an opening gives the part of the stomach beyond it rest from activity is quite erroneous. If the pylorus is not obstructed, this continued peristalsis results in forcing food through the normal exit at the pylorus. The physiologist has difficulty in seeing any advantage gained by this operation under these circumstances unless the passage of bile and pancreatic juice into the stomach reduces hyperacidity; and experienced surgeons now counsel against the operation unless pyloric obstruction is present."—W. M. B.

JONNESCO'S REPLY.

We are very glad to give space in this issue to the reply from Professor Jonnesco called forth by a query, and by certain statements, in our editorial of last month. Perhaps the most interesting feature of Jonnesco's short article is the hypothesis he advances for his contention that, by the addition of strychnine to the anesthetic solution, respiration continues after the superior spinal injection, even though the muscles of the head, neck and upper extremities are paralyzed, viz., that the strychnine probably exercises a selective action on the respiratory and cardiac nerves and centers.

It would hardly be proper to discuss here this last contribution from Jonnesco, who has recently left America. Moreover, it is evident from a comparison in this journal of his article with our last editorial, and in recent numbers of the *New York Medical Journal* of his report with that of Aspinwall Judd, that Jonnesco is by no means in accord with others present concerning the phenomena that have followed some of his high spinal injections in New York; therefore, any discussion borne of these recent demonstrations and reports, would lack all basis of agreement.—W. M. B.

Surgical Suggestions.

Ligation of the cystic artery at the beginning of a cholecystectomy often makes the removal of the gall-bladder a bloodless procedure.

A short drainage tube, and its early post-operative removal, are perhaps the best safeguards against the formation of an empyema sinus.

Colon irrigation, after the method of gastric lavage is sometimes effectual when the most actively compounded enemata are not.

By frequent feeding every two hours, an obstinate biliary fistula may spontaneously close.

Unilateral deafness without known cause, associated with facial palsy on the same side, should suggest a lesion in the posterior cerebral fossa.

Meltzer's sign—pain on active flexion of the hip, with the knee extended, while the examiner presses firmly down over McBurney's point—is a most valuable corroborative evidence of appendicitis. It is not intended for cases in which abscess is palpably present.

Book Reviews.

Surgical Diagnosis. By ALEXANDER BRYAN JOHNSON, Ph.B., M.D., Professor of Clinical Surgery in the Columbia University Medical College; Attending Surgeon to the New York Hospital, etc., etc. *In three volumes.* Large octavos. Vol. 1, 810 pages; 258 illustrations. Vol. 2, 777 pages; 256 illustrations. Vol. 3, 810 pages (including general index); 274 illustrations. New York and London: D. APPLETON & COMPANY, 1909, 1910. Price, per set, cloth, $18; half leather, $21.

The interesting purchaser of a "Surgical Diagnosis" can best appreciate the character of Johnson's work by a brief survey of the publications on this subject that have appeared in English within the past decade. Two of these—Gould's Elements of Surgical Diagnosis, 1903, and Berry's manual, London, 1904—are small books dealing with but certain phases of the subject. Berg's manual, 1905, covers practically the entire field of surgical diagnosis, but in a condensed fashion, and is intended for students and general practitioners rather than for surgeons. Frank's translation of Albert's work, 1902, is excellent, but no longer quite up to date. Three somewhat larger books have appeared more recently—Kiliani's, 1905; Eisendrath's, second edition, 1909, and Martin's, 1909. These are each comprehensive, single volume, and meritorious works.

Johnson's "Surgical Diagnosis" resembles these others in its title only. It is an exhaustive treatise of three large eight hundred page volumes—a remarkable work both in the magnitude of the labor it involved, and in the broad lines on which it is executed. With the delineation of signs and symptoms there are incorporated a large amount of pathological material and the records of illustrative cases, in such a manner that the work presents a complete clinical picture of each condition, its pathogenesis and pathological variations, and the diagnostic features and prognosis of its various phases. It includes, therefore, much—one might almost say most—of the material that is contained in works entitled "General Surgery" or "Principles of Surgery," and a great deal of what is to be found in books on Surgical Pathology.

Another noteworthy feature of Johnson's work is the amount of space that is generously, but not unduly, allotted to methods of examination—cystoscopy, esophagoscopy, etc. Forty-seven pages in volume one, and three and one-half pages in the appendix are devoted to *x*-ray apparatus, the technic of its employment and the consideration of its diagnostic value—a subject to which Johnson has given a great deal of his attention, and to the development of which he has contributed in no small degree.

Of the numerous illustrations, all of which are excellent, most are original photographs. Many of these are of cases at the New York Hospital gathered in the course of years for use in this book; others are borrowed from the collections of McBurney and other colleagues. There is, besides, a large number of well-reproduced skiagraphs made by the author—several of them in "plastic" effect.

Volume I deals with Wounds and Their Diseases, diseases of the Soft Parts and of the Bones, Tumors (in general), Fractures and Dislocations (in general), Syphilis, the *x-Rays*, the Head and Neck, the Thorax, the Breast, the Abdomen in general, the Peritoneum and Injuries of Special Abdominal Organs. *Volume II* continues the surgical diseases of the Abdomen and its Organs, and considers also the Rectum, the Urinary Organs and the Male Genital Organs. *Volume III* is devoted to the Spine, the Nerves, the Pelvis and the Extremities. It has also an appendix containing some miscellaneous new matter added to our knowledge since the chapters to which they belong were written.

Diseases of the Nose and of the Ear are discussed, but not ophthalmic diagnosis. Nor is there any consideration of gynecological diseases—which we regard as a serious omission in a work otherwise so complete.

We have thus considered this work in general terms, for that seems most fitting for a treatise so unique. Our chief criticism is that the author's enthusiasm has led him to be too disquisitive on subjects not within his theme. Again and again he considers surgical indications and treatment, and in the appendix we find an article discussing only the operative indications in benign diseases of the stomach. These discussions are not burdensome; they enhance rather than mar the value of the book; but they should be either omitted or recognized on the title page.

The Principles of Pathology. By J. GEORGE ADAMI, M.A., M.D., LL.D., F.R.S., Professor of Pathology in McGill University, and Pathologist to the Royal Victoria Hospitals, Montreal; and ALBERT G. NICHOLLS, M.A., M.D., D.Sc., F.R.S. (Can.), Assistant Professor of Pathology and Lecturer in Clinical Medicine in McGill University; Out-patient Physician to the Montreal General Hospital; Assistant Physician and Pathologist to the Western Hospital. *Volume II,* SYSTEMIC PATHOLOGY. Octavo; 1,082 pages; 310 engravings and 15 plates. Philadelphia and New York: LEA AND FEBIGER, 1909.

In the exposition of the pathological anatomy of the various organs the authors, in this volume, follow the original scheme of classification set forth in the first volume (*General Pathology*), written by Adami alone. In addition, however, this book differs from other works on systemic pathology by the introductory chapters on pathological physiology of the organs whose lesions are to be described. Pathological Physiology is a subject that is still comparatively untaught, and those who have appreciated its significance, especially through an acquaintance with Krehl's masterly work, will greet this introduction as both a timely and welcome innovation. Those chapters are manifestly the hand of the senior co-author, Adami, and reveal all his wonted grasp and breadth of knowledge, especially from a clinical viewpoint.

The work opens with a section on the Cardio-vascular system. Here the authors have introduced another innovation, in that they have included the pathology of the blood, a subject ordinarily relegated to the domain of general pathology. These chapters are admirable from every point of view. The authors then logically pass to the discussion of the lesions of the heart and bloodvessels. Especially worthy of mention is the chapter on arterio-sclerosis, which is the most succinct summary of the subject with which we are acquainted. The succeeding sections, in order, deal with the Respiratory Alimentary and Nervous Systems, the Ductless Glands, the Urinary and Reproductive Systems, the Skin, Muscles and Bones.

The least satisfactory parts of this book are those dealing with the pathological anatomy of the various organs. Compared to the lofty tone and comprehensiveness of the remainder of this work, and especially of the first volume, these chapters leave a decided impression of being elementary. In fact, were these chapters segregated, they would not even compare favorably with many text-books of pathology now at our service. It is only fair to say, however, as the authors fully appreciate, that this inadequacy is partly due to the exigencies of space, and partly to the fact that so much has already been covered by the more elaborately planned first volume.

The same care in arrangement and typographical exactness which we noted in the preceding volume are to be observed in this. The illustrations are largely original and while not over-numerous, they are well executed.

Compendium der Operationslehre. Von DR. EDUARD SONNENBURG, Geheimer Medizinalrat, ord. Professor honor. an der Universität, und DR. RICHARD MÜHSAM, Dirigierender Arzt am städt. Krankenhaus Moabit in Berlin. *Second Edition.* Octavo; 446 pages; 290 illustrations. Berlin: AUGUST HIRSCHWALD, 1910. Price, 9 Marks.

This volume, which is Volume XVI of the "Bibliothek v. Coler-v. Schjerning," is more extensive and complete than the so-called compendiums which appear in this country. It is divided into general and regional operative technic, and a careful perusal of the text shows that no subjects, not even those of minor importance, have been omitted. The newest advances have been discussed, such

as Bier's venous anesthesia, Momburg's ischemia, lung surgery under positive and negative pressure, etc.

The introductory chapters, which deal with construction of the operating room, suture materials, preparation of the patient, etc., are remarkably clear, concise and instructive. General surgical technic is fully discussed, and regional surgery in every branch, except that of gynecology, is very adequately treated. The illustrations likewise are satisfactory.

A few defects of the book are, however, too evident to be overlooked. Anatomical operations—for instance, amputation of the tongue or amputation of the breast—are epitomized to such an extent that their description would fail to convey any idea of their steps to the average student. In end-to-end suture of the intestine the great care necessary to obliterate the mesenteric gap is not emphasized, and the accompanying illustrations do not even picture the mesentery!

As Sonnenburg was one of the first German surgeons to operate for appendicitis the chapter dealing with this subject is of special interest. He employs a pararectus or an intermuscular incision (McBurney is not mentioned). In operations performed during the interval, after ligating the mesenteriolum, the appendix close to its base is *transfixed* with a catgut suture which is tied to both sides. The stump is buried in the wall of the cecum. This technic does not appeal to us, neither does incision and drainage of Douglas' abscesses through the rectum. The author pulls the skin toward the median line before making his incision for the intermuscular operation, because, upon healing, the skin and fascial scars are not superimposed, a *stronger abdominal wall thus resulting* (?).

In spite of a few similar defects this small volume will be found extremely useful for students and also for surgeons who desire to refresh their memory on short notice. References to the continental literature are quite voluminous—those referring to American sources are conspicuous chiefly by their absence.

The Principles and Practice of Medicine. Designed for the Use of Practitioners and Students of Medicine. By WILLIAM OSLER, M.D., Regius Professor of Medicine, Oxford University; Honorary Professor of Medicine, Johns Hopkins University, Baltimore, etc. *Seventh Edition.* Large octavo; 1,143 pages. New York and London: D. APPLETON & Co., 1909. Cloth, $5.50.

In the preparation of the sixth edition of Osler's classic, the work was practically rewritten and printed from entirely new plates. For this seventh edition no such extensive revision was necessary. The book is of the same number of pages as before, and most of these pages have required no alteration. Nevertheless, the revision has taken note of all the important advances in internal medicine that have been made in the last three years—the discovery of the cause of syphilis, "the work of the New York Pneumonia Commission, the triumph of the British army and naval surgeons in stamping out Malta fever, the splendid work of Gorgas and his colleagues at Panama, the studies of Strong and his associates in the Philippine Islands, the fresh work which has been done in trypanosomiasis, psorosomiasis, tropical splenomegaly, the experiences of the last epidemic of cerebro-spinal fever . . . . , with the hopeful work of Flexner . . . . , contributions on 'carriers' in the acute infections, ... the new views on . . . . tuberculosis, the remarkable studies upon epidemic anterior poliomyelitis, and the work upon Rocky Mountain fever, milk sickness and the serum disease." (Preface.)

In the chapters on diseases of the stomach the section on acute dilatation includes some recent statistics and presents the modern view of its causation. The section on peptic ulcer has been much revised, and the paragraphs on its diagnosis quite recast. Osler indicates that ulcer is the cause of many of the cases, misdiagnosed as simple hyperchlorhydria, gastralgia, dyspepsia, etc. He frankly states that the large statistics of ulcer of Moynihan and the Mayos "indicates that we physicians have been napping, and that what the modern 'gastro-enterologist' needs is a prolonged course of study at such surgical clinics as Rochester (Minnesota) or Leeds."

There are new sections, also, on diverticulitis, pancreatic and adrenal insufficiency, parotitis, pulmonary edema, Banti's disease, polycythemia, etc. The newer studies on aphasia, spastic paraplegia, and posterior basic meningitis are incorporated. A short section has been added descriptive of Oppenheim's disease (amyotonia congenita). From the therapeutic side, also, recent additions have been recognized, especially as they concern serum therapy, the surgical treatment of gastric and duodenal ulcer, etc.

With these not extensive but also not inconsiderable revisions, Osler's "Practice" in its present form will no doubt be for some few years the best single volume work on this subject. Of the sixth edition French and German translations have appeared, and it is interesting to note that Spanish and Chinese editions are being prepared.

Exercise in Education and Medicine. By R. TAIT MCKENZIE, B.A., M.D., Professor of Physical Education and Director of the Department, University of Pennsylvania; Sometime Lecturer in Anatomy and Medical Director of Physical Training at McGill University; Lecturer in Artistic Anatomy, Montreal Art Association, Harvard Summer School and Olympic Lecture Course, St. Louis, 1904, etc. Duodecimo; 406 pages; 346 illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1909.

We have no word but of praise for Dr. McKenzie's new work. Seldom is a subject presented as fully and in as readable a style. Bloodless surgery will take a stronger hold and climb further by reason of its great gain from a contemplation of the possibilities, methods and results of exercise as presented by the author.

The book is divided, as the title suggests, into two parts. Part I deals with exercise in education. Educators will find much to delight them here, for nowhere is there a more complete, concise and sane consideration of the relation of play, games, athletics, and gymnastics as a medium of education and as a corrective of the bodily deformities long dependent upon the carelessness, ignorance, or negligence of school authorities.

The physiology of exercise is properly made a basis of the chapter on *Massage and Passive Motions.* The description of the technic of massage is brief but illuminating. It must be noted at once that the illustrations actually illustrate and are carefully chosen. Historical medicine receives a tribute, too frequently omitted, by chapters on the German System of Physical Training and the Swedish System of Gymnastics. The chapter dealing with the "soft business of Japan," jiudo, presents some rare pictures and descriptions of the little tricks that so stirred the athletic world a few years ago. Delsarte and the French system, the American "doctrine of limpness" of Emily Bishop and the "doctrine of contraction," advocated by Sandow, are carefully weighed and duly criticised with the utmost caution and judgment.

Age, sex, and occupation call forth an excellent review of the adaptability of games to various ages. Especially commendable are the tabulation of athletic games and exercises with a relative statement of the regions of the body used; the demands on nerve control, influence on pulse, blood pressure and respiration; and the best age for their practice. If every business man could practice the suggested series of simple exercises without apparatus, there would be less ill-health among those leading sedentary lives. These movements are fully described and illustrated.

Playgrounds and Municipal Gymnasiums really constitutes a broad plea for free play for children and, in a high social spirit, maintains the right of the child to play. The relation of play to juvenile crime makes a strong argument. The description of various types of playgrounds is worthy the attention of municipal workers interested in the city beautiful and the children's development.

Physical Education in Schools brings out many of the postural defects of children due to poor school hygiene. The information regarding Public School athletic leagues

shows that there is a strong movement to make the physical health of school children of at least equal importance to their mental progress.

The system of outdoor class athletics used at the University of Pennsylvania is the basis of the plea for a "systematic education of bodily power" in colleges and universities.

For the first time the physical education of the blind and the deaf-mute is fully described. The methods of overcoming such tremendous physical and mental handicaps are effectively illustrated. The training of mental and moral defectives through exercises, games, athletics and work is similarly well handled.

Part II includes Exercise in Medicine. Beginning with the "application of exercise to pathologic conditions," the succeeding chapters involve the special application of physiologic principles to various abnormal conditions. "The efficacy of active and passive exercises depends upon the power to change anatomic structure and to stimulate physiologic function."

McKenzie cautions against too much deep breathing exercises during acute pulmonary tuberculosis.

Flat-foot and Its Treatment is full of suggestions, valuable because they possess an anatomic basis. With the present fad for arches it is well to remember that "more harm than good has been done by the use of ill-fitting and imperfectly supporting footplates."

The chapters on round back, stooped and uneven shoulders, and on scoliosis are splendidly lucid—and most useful to the general practitioner under whose care such conditions first come.

The exercise treatment of the diseases of circulation involves the Oertel "pedestrian exercises" and the Schott treatment. Obesity, gout, diabetes, gastritis, all receive due attention. The pages on treatment of constipation might be expanded to have its relative importance accentuated and the special exercises indicated. Hernia is particularly well treated in a new and radical manner.

Exercise in treatment of nervous diseases is unusually full of valuable pointers regarding stammering and chorea. A full discussion and illustration of the Fraenkel treatment of locomotor ataxia forms the concluding chapter.

The book was written for students and practitioners of physical training; for teachers of the youth; for students of medicine and its practitioners; and well may they use it. No more modern, scientific exposition of the subject has been presented.

The Prevention and Treatment of Abortion. By FREDERICK J. TAUSSIG, A.B., M.D., Lecturer in Gynecology, Medical Department, Washington University; Obstetrician to the St. Louis Maternity Hospital; Gynecologist to the St. Louis Skin and Cancer Hospital, etc. Large octavo; 180 pages; 59 illustrations. St. Louis: C. V. MOSBY CO., 1910. Price, $2.

Taussig has succeeded in writing a short and clear monograph which will prove of interest not only to the general practitioner, for whose benefit it is primarily written, but also to the specialist, who, in its pages, will find a complete résumé of our present knowledge on the subject.

The frequency, anatomy, pathology, etiology, symptoms and clinical course, diagnosis, differential diagnosis and prognosis are first considered. Twenty pages are devoted to the prevention of abortion. Treatment of abortion and its complications and sequelæ are fully dealt with. In an appendix, missed abortion, male pregnancy, therapeutic abortion and ergot are discussed.

We are pleased to see that in uncomplicated and uninfected cases the author advises non-interference; likewise, that after complete expulsion of the ovum, he does not insist on curettage. Budin's and Hoening's method of expression are rarely referred to, but Taussig gives them deserved emphasis. Many helpful hints, and a thorough discussion of all phases of the subject should make this short treatise of interest and value to the profession.

The illustrations are simple, clear and instructive; the paper and typography excellent. It is to be regretted that monographic presentation of a subject, which is so popular abroad, so rarely is attempted in America!

La Cure radicale de la Hernie inguinale. Leçons professées à l'Hôtel-Dieu par le DOCTEUR LUCAS-CHAMPIONNIÈRE, Chirurgien Honoraire de l'Hôtel-Dieu; Président de la Société Internationale de Chirurgie. Octavo; 192 pages; 53 illustrations. Paris. G. STEINHEIL, 1909.

In this work, Lucas-Championnière, who introduced radical hernioplasty into France, describes clearly and concisely the indications for, and steps of, the radical cure of inguinal hernia. His own operation, which has been somewhat misquoted, is again described and represented schematically. We believe this operation to be basically inferior to the Bassini procedure and to its modifications by Halstead, Ferguson and Andrews.

The author emphasizes the importance of great precision in the technical details, and in proceeding deliberately. He believes that failures are due to adhering too closely to routine procedures and to conducting them too hastily.

Biographic Clinics. *Vol. VI.* Essays concerning the influence of visual function, pathologic and physiologic, upon the health of patients. By GEORGE M. GOULD, M.D., formerly Editor of *American Medicine;* Author of Various Medical Dictionaries, "Borderland Studies," "The Meaning and the Method of Life," "Right-handedness," etc. Duodecimo; 492 pages. Philadelphia: P. BLAKISTON'S SON AND CO., 1909.

In this collection of 22 papers, Gould offers further ammunition in his campaign for the wider recognition of defects in visual function as factors in disease. Among the more weighty and interesting papers may be mentioned: The Case of Jonathan Swift; The Relation of Incorrect and Correct Refraction to Systemic Disease; A Strange and Illogical Case of Suicide; The Myth and Mystery of Mèniere's Disease; Fifty-seven Varieties of Medical and Ophthalmic Blunders, and The Rôle of Visual Function in Animal and Human Evolution. There is a number of papers which deal with errors of refraction as a cause of epilepsy. These essays are written in the author's familiar brilliant and vivid style, but reveal somewhat more bitterness than usual. The collection affords both pleasant and convincing reading.

St. Luke's Hospital Medical and Surgical Reports. *Volume I,* 1908-1909. Edited for the Medical Board by AUSTIN W. HOLLIS, M.D. Octavo; 225 pages. New York City.

This first volume of the annual report of St. Luke's Hospital contains the statistics of the various divisions and several meritorious articles of clinical interest. Among these is one by ABBE on the effect of radium in tumors; in some cases the good results are striking. DOUGLAS reports four interesting cases of hernia—two of the ovary and tube, one with tuberculosis of the sac, and the fourth complicated by peritonitis from appendicitis, thus simulating strangulation. HOLLIS has collected the cases of typhoid with hemorrhage, and believes that in rare selected cases blood letting may be of service. THOMAS in some cases of fracture of the forearm advocates an aluminum cleat.

The volume is well gotten up and contains numerous illustrations and charts. The radiograms would appear to better advantage if printed on heavy glazed paper.

The Physician's Pocket Account Book. By J. J. TAYLOR, M.D. Flexible leather; 24 pages of practical instructions; 216 pages of accounts. Philadelphia: THE MEDICAL COUNCIL, 4105 Walnut street. Price, $1.

This is a compact, complete and simple account book. Each entry is complete in itself, no posting to a ledger being necessary. Every entry is in plain language, no hieroglyphics being used, and the book may therefore be presented in evidence in court when it is necessary to bring suit on an account. Each account is always up to date. Besides the 216 pages for accounts, the book contains an index, business suggestions, the treatment of poisoning, table of infectious diseases, average fee bill, record of births, deaths and vaccinations, and a cash account.

Progress in Surgery.

A Résumé of Recent Literature.

Experimental Surgery of the Thoracic Aorta by the Method of Meltzer and Auer. ALEXIS CARREL, New York. *Journal of the American Medical Association*, January 1, 1910.

Carrel reports on experimental work done in the Rockefeller Institute in operating on the thoracic aorta by the method recently proposed by Meltzer and Auer, who demonstrated that by ventilating a lung with a continuous current of air, respiration takes place, even in the absence of respiratory movements. They introduced a small sized catheter into the trachea of the dog as far as the bifurcation and then passed a continuous current of air through it under low pressure. The air ventilated the lungs and escaped immediately to the exterior through the trachea. The animals could be kept in this condition for three or four hours or more, ether being introduced with the air. Carrel operated on the thoracic aorta on 6 dogs, using a foot bellows to ventilate the lungs. In three experiments the upper part of the descending aorta was cut transversely and the ends united by a circular suture, necessitating an interruption of the circulation from three to six and a half minutes. The first 3 animals recovered without incident. In the fourth experiment the ascending portion of the aorta was cut longitudinally about 3 cm. above the heart and sutured. This operation involved two interruptions of the circulation, each lasting about 30 seconds. The animal remained in good health. The fifth experiment consisted in severing the ascending aorta in the middle and interposing between its ends a segment of a large jugular vein preserved in cold storage. The circulation was interrupted for seventeen minutes. The sixth experiment was done by temporary tubing of the aorta in order to avoid medullary complications. The upper part of the descending aorta was laid open by a longitudinal incision and a paraffined tube inserted into its lumen and temporarily fastened. This involved only a brief interruption of the circulation which was immediately reestablished, and it was possible to extirpate at leisure the anterior wall of the part of the vessel tubed and to substitute for it a segment of vena cava preserved in cold storage. The operation lasted 24 minutes. The tube was then taken out through a small incision in the outer wall and normal circulation reestablished. The animal recovered but death occurred suddenly from hemorrhage 12 days later, due to a defect in the vein preserved in cold storage. These experiments, Carrel says, prove that operations on the thoracic aorta need not be dangerous but are as simple as abdominal operations, by this method. Suture of the descending aorta is almost identical in technic with suture of other arteries, but the ascending aorta is very friable and the technic should therefore be modified. The immediate results are excellent. The problem of operating on the aorta without interfering with the circulation presents several different solutions. In case of sacciform aneurism it would be possible to extirpate the sac and close up the opening without interrupting the circulation by the operation Carrel described some years ago as longitudinal exclusion. The problem is more difficult if it is necessary to resect a large part of the wall or a whole segment. Two other methods are theoretically possible, the definitive or temporary lateral derivation, and the temporary tubing. He has not attempted the former method on the aorta but he has implanted a vein preserved in cold storage on the right auricle to establish a collateral substitute for the superior vena cava. The operation was not very difficult. These methods are inconveniently complicated and temporary tubing is simpler and more rapid and can be done more leisurely.

Extirpation of the Lungs With the Employment of Both Forms of Differential Pressure (*Untersuchungen ueber die Lungenexstirpation unter vergleichender Anwendung beider formen des Druckdifferenzverfahrens*). S. ROBINSON, Boston, and F. SAUERBRUCH, Marburg. *Deutsche Zeitschrift fur Chirurgie*, Vol. 101, Parts 4-6.

The experimental removal of lobes of lungs is usually successful. On the other hand, the extirpation of a whole lung from one side, though technically not difficult, has generally been attended by a high mortality. The causes of death are various: Rarely death follows directly after ligation of the vessels of the hilus or ligation of the bronchus. More frequently death is due to an infection of the pleural cavity. In a third group of cases death results from a mediastinal emphysema. The avoidance of a pneumothorax is to be sought in the careful ligation and inversion of the bronchial stump.

Aside from these considerations, the writers find a cause for poor results in the use of the positive air pressure apparatus. They find that, with the latter, a gap is left after the lung is extirpated; when the pleural cavity is closed fluid rapidly fills in the gap, and this transudate is very prone to become infected. Or, with the over-pressure apparatus, a closed pneumothorax is present when the wound of the pleura is sutured. Neither condition is apt to occur, the authors assert, when the negative pressure apparatus is used because, with it, the diaphragm is "sucked" up, the heart and mediastinum are drawn over, and the pleural gap is in large part obliterated.

Additional measures may be necessary to further narrow the pleural space. By resection of several ribs the chest wall can be so mobilized that parietal pleura may come in contact with mediastinal pleura. Another means of attaining this end is the free mobilization of the parietal pleura, as advised by Garré. In operating on the human being, this result may be reached by performing the pneumectomy in two stages, the first stage being the delivery and attachment of the lung to the chest wall.

The Surgical Treatment of Empyema Thoracis. CHAUNCEY E. TENNANT, Denver. *Annals of Surgery*, January, 1910.

Tennant believes that by the Murphy treatment of empyema thoracis it is quite improbable that the entire collection of pus can be removed. He refers to the suction methods of Weller Van Haak, Bryant and Brewer. To secure expansion of the lung seems to Tennant impossible while a foreign body, such as a drainage tube, is in the pleural cavity. The longer the delay in recovery the greater are the thickening and contraction of the pulmonary pleura.

Tennant advises: An opening of reasonable size and stability, best secured by subperiosteal single rib resection; entry into all packets of pus, breaking down encapsulations with finger or probe; introduction of several large drainage tubes. Suction on each tube, with large syringe, several times daily, to remove all coagula. Removal of the tubes as soon as they have done their work, usually on the fifth or sixth day. Application of the Bier cups (if there is no bronchial communication) and forcible expiration, to secure lung expansion; the cup applied one-half hour at a time. In Tennant's experience the wound closes within 17 days by this plan of treatment.

On Surgery of the Lungs (*Ueber Lungenchirurgie*). FRIEDRICH, Marburg. *New Yorker Medizinische Monatschrift*, October, 1909.

In the paper read before the German Medical Society of New York, June, 1909, Friedrich first points out the invaluable service of *x*-ray examination for the localization of pulmonary lesions, without such examination the surgeon would often be at a loss as to the level of entry into the chest cavity.

Of the diseases which he has treated surgically, the writer first discusses tuberculosis. Although he believes that the surgical treatment of certain forms of this disease is yet in its infancy, he is able to report good results in the mobilization of the chest wall—sometimes mobilizing the pleura in addition—in cases of old cavernous phthisis. After several months the chest wall has sunk in, the cavities have collapsed and the symptoms, physical signs and *x*-ray examination demonstrate the improvement.

Good results have also been obtained in the Freund operation for emphysema. Friedrich is not content with division of the ribs for the mobilization of the rigid thoracic wall; he removes long sections of the ribs to avoid bony or fibrous union.

Among the most difficult cases are those of bronchiec-

tasis. Here fluoroscopic examination is often of value in the diagnosis, but it may sometimes be very misleading. The disease is not infrequently bilateral. Several surgeons have successfully performed pneumectomy for the condition—Friedrich has had some good results by removal of several ribs, thus mobilizing the chest wall and compressing the diseased lung.

Empyema is treated very conservatively by the writer. In this he is opposed to the views of most surgeons. He employs a small intercostal incision, through which he drains by the Thiersch valve drainage method, reserving the more extensive operation for those cases in which good drainage is not obtained by the simpler maneuver.

In connection with the difficulties associated with pneumectomy, Friedrich calls attention to some very suggestive experimental work performed in his clinic by Lichthims, Tigerstedt, Sauerbruch and others. It has been ascertained by these workers that ligation of one of the trunks of the pulmonary artery leads to an extreme shrinking of the corresponding lobe of a lung—neither gangrene nor pneumonia accompany this shrinking process. The future will show whether, by this means pneumectomy in two stages may be more safely performed.

Blood Transfusion as a Therapeutic Measure. WILLIAM FRANCIS CAMPBELL. *The New York State Journal of Medicine*, June, 1909.

In the chronic hemorrhages which endanger life by their persistence, transfusion of blood is a rational and therapeutic measure. In these cases the transfused blood not only supplies new nourishment and oxygen carriers, but stimulates the blood-forming organs of the recipient, a fact borne out by the observation that in transfused patients an increase in hemoglobin is noted a few days after the operation.

Direct transfusion increases the coagulability of the recipient's blood. Chronic hemorrhages from the stomach and intestine have been checked by this method, and Bloodgood urges that direct transfusion be tried in typhoid hemorrhage and obstructive jaundice with slow coagulation time.

Direct transfusion has a future in those acute toxic states such as ptomaine and coal gas poisoning, eclampsia, uremia, etc. Note the recent experiments of Crile with dogs poisoned with coal gas and then bled and transfused with the blood of healthy dogs.

Clinical and Physiological Aspects of Rupture of the Chyle Duct. W. S. HALL and W. E. MORGAN, Chicago. *Quarterly Bulletin of the Northwestern Medical School*, June, 1909.

The history of this exceptionally interesting case is the following: A boy, 13 years old, was run over by a wagon, one of the wheels passing over the lower chest and right upper abdomen. Symptoms of severe intra-abdominal injury ensued; operation was advised, but refused. In the course of the next few days, the symptoms improved and on the fifth day Morgan was asked to see the patient. He found a pale, half-starved boy apparently in suffering; there was marked evenly distributed distension of the abdomen, a pulse of low tension and respirations of 30-34. There was tenderness in the epigastrium and distinct evidences of free fluid in the peritoneal cavity. A week later the distension of the abdomen had greatly increased, resulting in considerable distress. The boy was eating all sorts of food and in large quantities, but without any relief to his hunger. The bowels moved naturally. Morgan suspected injury to the receptaculum chyli and the diagnosis was confirmed when two and a half gallons of chylous fluid were removed by tapping. The boy eventually and spontaneously recovered. Metabolism experiments were carried out by Hall, resulting in some interesting observations, but there are more of physiological than surgical interest.

Breast Abscesses. A Report of Seven Cases Treated by Bier's Suction Method. R. L. DE NORMANDIE, Boston, *Boston Medical and Surgical Journal*, May 19, 1909.

The author is extremely satisfied with the results obtained by this method of treatment as compared with the method he previously practiced, in which large radiating incisions was the rule. The abscess heals uneventfully and is left with but slight impairment of function. The method consists in applying hyperemia once a day with a large cup for periods averaging five minutes repeated three to seven times. As soon as pus is ascertained a stab wound is made into the abscess. There was only one failure in these seven cases, but this the author explains by the fact that the treatment was not carried out as it should have been.

Etiology of Arthritis Deformans. A Preliminary Report. J. HECKMAN, New York, *Medical Record*, June 5, 1909.

The author has examined 4 cases of monarticular and 11 polyarticular forms of arthritis deformans and found a positive Wasserman reaction in all of the monarticular types and in nearly all of the polyarticular. The author believes, therefore, that syphilis plays a large rôle in the etiology of this malady. Inasmuch as in all of the monarticular types a history of trauma was obtained, he believes that in these cases the trauma is the inciting and syphilis the underlying cause. In the polyarticular forms, in the same way, he believes a rheumatic diathesis is the exciting cause.

A Preliminary Report Upon the Advisability of Thyroidectomy in Catatonic Dementia Precox. ALLEN B. KANAVEL. *Illinois Medical Journal*, September, 1909.

Kanavel operated upon eight cases in the Cook County Institution for the Insane. Two were early cases and showed marked improvement after seven-eighths of the thyroid gland had been removed.

A New Suture. R. M. MCMILLEN. *The West Virginia Medical Journal*, September, 1909.

First put in suture the same as the ordinary interrupted suture. Thread the reverse end of suture and insert needle into the skin very close to the edge of wound about one-sixteenth of an inch. Pass the needle through the skin only, and on over and catch the skin on wound side, and come out on cuticle side about one-sixteenth inch from edge.

The sutture is then tied by a reef knot drawn with sufficient force to bring deep structures together. The inner margins of the skin will then seem to be in exact apposition, and the cut surfaces of the skin will be together when the pressure of the dressing is applied.

The knots are at the side of the wound, and their removal will not disturb the line of union. The line of union is not constricted by the suture and the blood and nerve supply is not interfered with. This suture reduces the size of the scar to a minimum.

Fractures of the Clavicle. W. F. WESTMORELAND. *International Journal of Surgery*, September, 1909.

The fracture is reduced by position, the patient being laid flat on his back on a table; if allowed to remain this way for a few minutes, with arm comfortably by the side, the fracture usually reduces itself.

The patient is now pulled over the end of the table until the scapula clears it; an assistant supports the patient's head with one hand and the shoulder with the other; the latter hand is placed on the spine between the shoulder-blades, so the scapula can swing clear.

The line of the body is kept on a level, but the shoulders are allowed to drop to a lower level.

The fracture is usually reduced by position alone when the scapula clears the table. The reason the fracture is not always reduced by position alone is the nervous dread of the patient, which makes him stiffen and contract his muscles.

If the fracture is not reduced, the arm is slightly abducted from the side and gently pushed a little toward the head, keeping it upon the same line, and the acromion process is gently pushed back, approximating the scapula behind; this always reduces the fracture.

With the patient in above position, a plaster-of-Paris splint is applied. Before the patient is placed on the table a closely fitting undershirt is put on. If only a loose one can be secured, cut it open and fit it as closely as possible.

Over this the splint is applied. The plaster-of-Paris splint should come well down over the ribs, so as to support the shoulder without the edge of the plaster of the opposite side pressing into the ribs, which will occur if the body part of the splint is too short.

The position of the arm of the injured side is immaterial. It is better to abduct the arm just enough to be able to pass the bandage easily under the axilla.

Suppurative Pericystitis. A. L. CHUTE, Boston. *Boston Medical and Surgical Journal*, September 23, 1909.

Suppurative pericystitis is a somewhat uncommon condition in which the suppuration takes place in the zone of loose tissue above the bladder, and in which either a part or the whole of the space of Retzius becomes a veritable abscess cavity. In a large proportion of cases the infection is secondary to some disease of the lower urinary tract. The infection of the pre-vesical space takes place by direct extension, or throug the lymphatics. In a considerable number of cases of suppurative pericystitis the infection is through the blood stream and may come from a focus existing in practically any part of the body. In some instances, the disease is an extension from a neighboring intra-abdominal or intra-pelvic lesion. The characteristic thing diagnostically is the presence of a mass above the pubis which more or less closely resembles the full bladder but which is unaffected by passing the catheter. The disease is one that will probably always have a considerable mortality. It is of a secondary character and its mortality will depend largely upon the nature of the disease that it is secondary to. The treatment consists in free drainage.

A New Method of Sterilization of the Skin for Surgical Operations (*Eine neue Sterilisierungsmethode der Haut bei chirurgischen Operationen*). A. GROSSICH, Fiume, *Berliner Klinische Wochenschrift*, October 25, 1909.

This method consists merely in applying tincture of iodine to the dry shaven skin. *It is absolutely necessary that water shall not come in contact with the skin previous to the application of the iodine; otherwise the disinfection is incomplete.* Grossich reports 2,284 operations in which this method was employed, without an infection in a single instance. [Since Grossich's first communication, published over a year ago, reports of the trial of his method, from many sources, are uniformly satisfactory. His method is apparently an important innovation.]

The Clinical Results of Gastro-Enterostomy. A Preliminary Report. H. W. BETTMANN and F. W. WHITE, Cincinnati, *Medical Record*, October 9, 1909.

The authors set out to study the after-history of 150 cases of gastro-enterostomy for benign obstruction. They found that only about 60 per cent. were either well or much better, while fully 30 per cent. died or were little or no better at the time of report. The immediate mortality was 10 per cent. Cancer developed in three patients. Secondary operations were required in 15 patients. In the vast majority the second operation was required for either vicious circle or closure of the opening. Of these patients, five were well or much better. In the remainder no improvement resulted.

The Conservative Treatment of Severe Wounds of the Extremities and Limbs Threatened With Gangrene (*Zur konservativen Behandlung schwerer Extremitätenverletzungen und gangränverdächtiger Glieder*). PROF. H. NOESSKE, Kiel, *Centralblatt für Chirurgie*, October 2, 1909.

In severe wounds of the extremities in which gangrene is threatened, as evidenced by cyanosis and coldness of the distal part, the author believes that the gangrene results from stasis of the blood. In order to promote the circulation, the author recommends one or more small incisions in the cyanosed area, application of a camphor-oil dressing (to prevent drying), and placing the extremity in a suction apparatus at a negative pressure of between 12-15 cm. for 8 to 10 minutes. This is done two or three times a day for a week. It will be noticed that arterial blood exudes which increases in quantity day by day. The color slowly improves, the sensibility of the part returns and the wound heals nicely. In a number of cases the author believes that he has saved portions of an extremity which would otherwise have become lost.

Isolated Fracture of the Transverse Process of a Lumbar Vertebra. SIDNEY LANGE, Cincinnati, *New York Medical Journal*, October 9, 1909.

Lange reports two cases in which fracture of the transverse process of the lumbar vertebra was the cause of an obstinate lumbago. In the first case, the fracture was caused by lifting of a heavy body, in the second by a blow. In both instances, the fracture was discovered by the *x*-ray. The recognition of this form of fracture as a possible cause of lumbago is obviously of importance for both therapeutic and prgnostic reasons.

Congenital, Hereditary and Family Hematuria. JOHN AITKEN, Kilmarnock. *Lancet*, August 14, 1909.

Aitken reports a family of 17 persons, of three generations, 10 of whom suffered from attacks of hematuria. There was no history of hemsphilia in the family. Six children of the last generation all suffered from hematuria, in all probability, ever since birth. Red blood cells with albumen can be found in the urine of three patients at any time, but at certain intervals, the amount of blood discharged is increased, so that the urine appears light red or smoky. The attacks are accompanied by fever, and may be brought on by slight colds. Diet has no effect.

The author's case resembles those of Guthrie, who made the first report of the subject in 1902.

The So-called Murphy-Fowler After-Treatment of Appendicitis. *The Universal Misapprehension in Regard to the True Cause of the Cure of Those Cases Complicated by Diffuse Suppurative Peritonitis.* G. S. BROWN, Birmingham, Ala. *Surgery, Gynecology and Obstetrics*, December, 1909.

Brown claims that the good results of the Murphy-Fowler method are due neither to the elevated posture nor to proctoclysis, but to stomach-lavage and abstinence from food and purgatives as originally proposed by Ochsner. In the treatment of desperate cases of diffuse peritonitis Ochsner advised to "splint the bowel" with opiates, abstain from giving food and purgatives, and use stomach lavage. The common error has been to regard the paralysis of the bowel as a vicious complication; on the contrary it is nature's effort to limit and help encapsulate the infection. The upper, healthy portion of the bowel should be kept quiet until the inflamed part shows that the inflammation is subsiding by, of itself, inaugurating feeble motion. In other words, when the bowels show a tendency to move it is a sign that the inflammation is subsiding, *but we should not reason from this that forcing the bowels to move will cure the inflammation.* In 1904 Brown had already advocated the Ochsner treatment, which he proposed to render more effective by draining an abscess or removing the appendix, which continued to supply new sources of infection. By cutting out the source of infection, unless too great a supply of toxines has already reached the general system, we will cure the patient without drainage—and the Fowler posture is useful only when drainage is employed. The 46 degrees of elevation often causes a severe strain on the heart. Hypodermoclysis in bad cases is quicker in action than proctoclysis. Therefore, though the adoption of the Murphy-Fowler method has been a great boon to surgery, the explanation of its good results has not been understood.

The Prophylaxis of Post-Operative Peritonitis (*Zur Prophylaxe der postoperativen Peritonitis*). O. HOEHNE, Kiel. *Muenchener Medizinische Wochenschrift*, December 7, 1909.

Pfannenstiel, based upon the experiments of Glimm, has a dried injection of 10 per cent, camphor oil into the peritoneal cavity before closing a laparotomy wound, if pathogenic bacteria have been encountered. The author continued Glimm's experiments and found that the protective action is not due to blocking of the lymph channels by the fat, but to an irritative (chemical) peritonitis. The result-

ing exudate is strongly bacteriacidal and the inflammation partly occludes the channels of absorption. He also noted that the injection must be made at least twenty-four hours before bacteria are added, if the full protective action is wanted.

Based upon these experiments, 42 cases have been treated before operation with camphor oil (carcinoma of uterus, pyosalpinx, suppurating hematoceles and ovarian cysts, etc.). The technic is as follows: Under local anesthesia a minute incision is made below the umbilicus through the fascia. A blunt trochar is then pushed through this cut into the peritoneal cavity and with a syringe 30 c.cm. of previously warmed, 10 per cent. camphor oil are injected through the trocar. The small wound is covered aseptically. The reaction is slight. Twenty-four hours later the laparotomy is performed. The peritoneum is found congested and covered with a slight fibrinous exudate.

The Treatment of Eclampsia (*Zur Therapie der Eklampsie*). A. DIENST, Oppeln. *Zentralblatt für Gynäkologie*, December 11, 1909.

Among the many theories evolved to explain eclampsia, an overproduction of fibrin, with consequent production of numerous minute liver and lung emboli, has become prominent if not yet generally accepted. Hyperleucocytosis favors thrombosis, as does an increase in the sodium chloride of the blood.

Starting from these premises Dienst treats eclampsia as follows: Prophylactically where there is edema or albuminuria he gives a chloride free diet—tea, cocoa, coffee, malt coffee, lemonade (hydrant water), rice, farina, sago, potatoes, farinaceous desserts, pudding, vegetables, salad, fresh or boiled fruit, two eggs daily, salt-free bread and fresh butter. No salt should be added, and no milk or meat injested.

If eclampsia develops rapid delivery should be resorted to (vaginal Cesarian section), immediate removal of the placenta and *intravenous* injection of Hirudin (2 mg. in 50 c.cm. of normal salt solution). During the puerperium the salt-free diet is continued and nursing (which increases leucocytosis) forbidden. The Hirudin proved life-saving in a very severe case of eclampsia (pulse 180 only obtainable at the heart).

Adrenalin in the Treatment of Hyperemesis Gravidarum (*Hyperemesis gravidarum und Adrenalintherapie*). S. REBAUDI, Genoa. *Zentralblatt für Gynäkologie*, October 30, 1909.

Hyperemesis of pregnancy has been said to be due to nervous or toxic influences or to a combination of the two. Vasomotor disturbances are also frequent. Freund has found engorgement of the inferior turbinate in 66 per cent. of all pregnant women. Possibly the vomiting is due to disturbance of the vomiting center in the medulla which is close to the vasomotor center.

In a desperate case of hyperemesis of the third month of gestation, in which all measures had failed, Rebaudi was called in to empty the uterus. Instead of doing so he gave ten drops of adrenalin 1 : 1,000 by mouth, morning and evening. The good result was immediate and lasting. After 11 days the dose was reduced, and after 9 days discontinued.

The author recommends the remedy, though he is uncertain whether the good effect is due to vasomotor or antitoxic causes.

Appendicitis Complicating Pregnancy, Labor and the Puerperium. P. FINDLEY, Omaha. *American Journal of Obstetrics*, December, 1909.

The author reports seven cases of appendicitis which occurred during pregnancy, labor or the puerperium. Of these three died (one unoperated). From his experience and from the study of the literature he concludes that though pregnancy does not incite a primary attack, recurrent attacks may be precipitated by pregnancy, labor or the puerperium. Severe attacks may be confounded with puerperal infection. Mild attacks do not alter the course of pregnancy; severe attacks commonly lead to fatal death. A woman in the child-bearing period who has had one or more attacks should be operated upon because of liability of recurrence during pregnancy. During pregnancy mild attacks require no interference unless oft repeated. Severe attacks should be operated upon without delay. Near term or during labor empty the uterus and then remove the appendix. Where an abscess is present early drainage is imperative, as the contracting uterus may rupture it. After operation every effort must be made to prevent miscarriage—rest, opiates, minimum of trauma to the uterus during operation.

Annals of Surgery. To mark the completion of its 50th volume, the December, 1909, issue of the *Annals of Surgery* appeared as a "Jubilee Number" of 387 pages, containing 23 original articles. Among the contributors are MacEwen (Glasgow), Robert Jones (Liverpool), Harvey Cushing, Charles Mayo, Thonkild Roosing (Copenhagen), Henri Hartmann (Paris), Rafaele Bastianelli (Rome), Rutherford Morison (New Castle), B. G. A. Moynihan (Leeds), and Alexander Primrose (Toronto). Dr. Lewis S. Pilcher has guided the *Annals* throughout its long career. At one time it was the only surgical journal published in English.

Experiments Upon the Artificial Production of a Bloodless State in Cranial Operations (*Versuche über künstliche Blutleere bei Schädeloperationen*). F. SAUERBRUCH, Marburg. *Centralblatt für Chirurgie*, November 20, 1909.

The author found that if he placed the bodies of animals in his low pressure chamber, leaving the head to project, the venous oozing from the meninges, and diploë ceased entirely when the pressure reached 20 m.m. of mercury. The arterial hemorrhage was, however, not affected. This method has not been tried as yet in human beings.

The Pitutiary Body; and the Therapeutic Value of the Infundibular Extract in Shock, Uterine Atony and Intestinal Paresis. W. BLAIR BELL, Liverpool. *British Medical Journal*, December 4, 1909.

As the result of physiological experiments, confirmed by a number of clinical observations, the author concludes that the administration of infundibular extract has a marked effect on the rise of blood pressure, and on the contraction of the uterus and the intestinal muscle. In its effects upon the rise of blood pressure, the action of infundibular extracts is as marked as adrenalin; it has a distinct advantage over this drug, however, in the prolongation of its action. Its action on uterine muscle is very powerful; this was particularly manifest in two cases of Cesarian section and in one of post-partum hemorrhages. The action of infundibular extract on intestinal muscle was clinically tested in a number of cases of intestinal atony, with unfailingly satisfactory results. The author noted some other collateral effects of this drug which should prove of additional value, such as the diuretic effect, and its slowing and tonic action upon the heart. The drug is administered hypodermatically in a 20 per cent. solution.

Bullet Wound of the Brachial Artery. Resection and Circular Suture. (*Schussverletzung der Arteria brachialis. Resektion und zirkuläre Naht der Arterie*). W. BURK, Stuttgart. *Muenchener Medizinische Wochenschrift*, December 7, 1909.

Only 17 cases of resection and suture of vessels have been reported. To these the following case may be added. A man of 29 years was shot in the left arm with a pistol. The arm at once swelled, felt cold and anesthetic. The wound of entry was at the junction of the upper and middle third of the arm at the inner edge of the biceps. No brachial or radial pulse could be felt; the extremity was cold and cyanotic. As no improvement occurred within four hours, the brachial artery was exposed, coagula removed and the severe arterial hemorrhage controlled. The artery was found divided completely except for a small bridge posteriorly. Two centimeters of the vessel required resection because of the laceration. A Carrel suture was then practised and the radial pulse could at once be felt. No other important structures had been injured. The wound healed by primary union. The radial pulse on the affected side is only slightly less marked than on the opposite one.